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RECORD OF DECISION

Welsbach/General Gas Mantle Contamination Superfund Site
Operable Unit 2: Armstrong Building
Gloucester City and Camden, Camden County, New Jersey
Site ID: NJD986620995

September 2011

United States Environmental Protection Agency
Region 2
New York, New York

DECLARATION STATEMENT

SITE NAME AND LOCATION

Welsbach/General Gas Mantle Contamination Superfund Site

Gloucester City and Camden, Camden County, New Jersey

National Superfund Database Identification Number: NJD986620995

Operable Unit 2 (OU2): Armstrong Building

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the Selected Remedy for Operable Unit 2 (OU2), the Armstrong Building, at the Welsbach/General Gas Mantle Contamination Superfund site (Welsbach Site), Gloucester City and Camden, Camden County, New Jersey. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP). This decision is based on the Administrative Record file for the Welsbach Site; the index for the Administrative Record is contained in Appendix IV. The New Jersey Department of Environmental Protection concurs with the Selected Remedy.

ASSESSMENT OF THE SITE

The response action selected in this Record of Decision (ROD) is necessary to protect the public health, welfare, and the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this ROD addresses radiologically contaminated building surfaces in the Armstrong Building at the Welsbach Site. It represents the second of four planned remedial phases, or operable units, for the Welsbach Site. EPA issued a ROD for the first Operable Unit on July 23, 1999 to address soil contamination. On September 25, 2005, EPA signed a ROD for the third Operable Unit that indicated that no remedial action was necessary for the surface water, sediments and wetlands at the Welsbach Site. A fourth Operable Unit is planned to address potential groundwater contamination.

The major components of the Selected Remedy are:

- Decontamination (physical and/or chemical) of radiologically contaminated building surfaces in the Armstrong Building.

- Transportation of radiologically contaminated wastes generated during the remedial action to an approved off-site facility.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1:Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost-effective. EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Welsbach Site.

Part 2:Statutory Preference for Treatment

There are some treatment technologies that may reduce mobility of radionuclides in soil (*e.g.*, stabilization), and reduce the volume of contaminated soil (*e.g.*, soil separation); however, these technologies are not implementable for building materials associated with the Armstrong Building. Therefore, the statutory preference for treatment as a principle element cannot be met. Although the Selected Remedy will not reduce the mobility or volume or radionuclides through treatment, it will reduce the mobility of radioactive contaminants by removal, off-site disposal, and management of the contaminated material at an approved landfill permitted to accept radioactive waste.

Part 3:Five-Year Review Requirements

Five-Year Reviews will not be necessary since all radiologically contaminated building surfaces above the Remediation Goal for the Armstrong Building will be removed through the implementation of the Selected Remedy. By meeting the Remediation Goal, the Armstrong Building will be released to the property owner for unlimited use and unrestricted exposure.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for the Welsbach Site.

- Radionuclides of concern and their respective concentrations are found in the "Summary of Site Characteristics" section.
- A discussion of the baseline risk represented by the radionuclides of concern may be found in the "Summary of Site Risks" section. This discussion is based on the Baseline Risk Assessment in the 2011 Supplementary Remedial Investigation Report.
- Cleanup levels for the radionuclides of concern and the basis for these levels can be found in the "Remedial Action Objectives" section.
- A discussion of principal threats may be found in the "Principal Threat Waste" section.
- Current and reasonably anticipated future use assumptions for the Armstrong Building used in the baseline human health risk assessment and ROD can be found in the "Current and Potential Site Uses" section. Potential land and groundwater use changes are not dealt with in this ROD because the remedy involves the decontamination of a building.
- Estimated costs for each alternative can be found in the "Description of Alternatives" section.
- Key factors used in selecting the remedy (e.g., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) can be found in the "Statutory Determinations" section.

Walter E. Mugdan

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EPA, Region 2

Sept. 27, 2011
Date

RECORD OF DECISION

DECISION SUMMARY

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United States Environmental Protection Agency
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TABLE OF CONTENTS

SITE NAME, LOCATION, AND DESCRIPTION 1
SITE HISTORY AND ENFORCEMENT ACTIVITIES 1
HIGHLIGHTS OF COMMUNITY PARTICIPATION 2
SCOPE AND ROLE OF OPERABLE UNIT 3
SUMMARY OF SITE CHARACTERISTICS 3
CHARACTERISTICS OF THE RADIONUCLIDES OF CONCERN 7
CURRENT AND POTENTIAL FUTURE SITE USES 7
SUMMARY OF SITE RISKS 8
REMEDIAL ACTION OBJECTIVES 12
DESCRIPTION OF ALTERNATIVES 13
SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES 15
PRINCIPAL THREAT WASTES 19
SELECTED REMEDY 19
STATUTORY DETERMINATIONS 20
DOCUMENTATION OF SIGNIFICANT CHANGES 22

List of Appendices

Appendix I: Tables
Appendix II: Figures
Appendix III: Responsiveness Summary
Appendix IV: Administrative Record Index
Appendix V: State Letter of Concurrence

ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Materials
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cy	Cubic Yards
$dpm/100cm^2$	Disintegration per Minutes per 100 Square Centimeters
EPA	Environmental Protection Agency
FS	Feasibility Study
FSS	Final Status Survey
GGM	General Gas Mantle
Holt	Holt Hauling & Warehousing, Inc.
HVAC	Heating, Ventilation and Air Conditioning
IEM	Integrated Environmental Management, Inc.
LLC	Limited Liability Company
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
NCP	National Oil and Hazardous Substances Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRG	Preliminary Remediation Goal
Ra-226	Radium-226
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RG	Remediation Goal
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
Th-232	Thorium-232
UQSM	Unimportant Quantities of Source Material
Welsbach	Welsbach Company
Welsbach Site	Welsbach/General Gas Mantle Contamination Superfund Site

SITE NAME, LOCATION, AND DESCRIPTION

The Welsbach/General Gas Mantle Contamination Superfund Site (Welsbach Site) (Identification Number: NJD986620995) is a multi-property site centered around two former thorium gas mantle manufacturing companies in the cities of Gloucester City and Camden, New Jersey. Approximately 100 residential, commercial, and industrial properties make up the Welsbach Site. This Record of Decision (ROD) for the second Operable Unit (OU2) at the Welsbach Site addresses radioactive contamination in the Armstrong Building, the last remaining Welsbach Company (Welsbach) era building.

The Armstrong Building is located on the former Welsbach facility at Ellis and Essex Streets, in Gloucester City. This property is currently an active port, warehouse, and logistics facility owned by GMT Realty Limited Liability Company (LLC) and operated by Gloucester Terminals LLC. The property is surrounded by residences, commercial properties, the Walt Whitman Bridge, and the Delaware River. Past activities in the Armstrong Building have included the manufacture of thorium-containing gas mantles. See Figures 1 and 2 in Appendix II for the locations of the Welsbach Site and Armstrong Building.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Welsbach Site History

Between the 1890s and 1940s, Welsbach manufactured gas mantles at its facility in Gloucester City. Beginning around 1895, Welsbach imported monazite ore to use as its source of the radioactive element thorium. Welsbach extracted thorium from the ore and used it in its gas mantle manufacturing process since thorium caused the mantles to glow more brightly when heated. Just after the turn of the 20th century, Welsbach was the largest producer of gas mantles and lamps in the United States, making up to 250,000 mantles per day. It appears that around 1915, Welsbach moved its operations from the property along the southwestern corner of Ellis and Essex Streets to the newly built Armstrong Building and other buildings on the north side of Essex Street. Welsbach went out of business in 1940.

During the years Welsbach was in operation, ore tailings and other wastes were used as fill throughout the Gloucester City area. Over the past 100 years, a number of Welsbach buildings were demolished and the building debris may also have been used as fill materials.

A second gas mantle manufacturing company, General Gas Mantle (GGM), located in Camden, was a small competitor to Welsbach. GGM operated from 1912 to 1941. While there is little information on its activities, it appears that GGM did not process ore materials and only used refined thorium in its gas mantle manufacturing processes.

The Welsbach Site was initially identified by the U.S. Environmental Protection Agency (EPA) as part of its investigation at the U.S. Radium Corporation Superfund Site in Orange, New Jersey. Historical records from U.S. Radium indicated it had purchased radium from Welsbach. In 1981, as a result of this information, EPA sponsored an aerial radiological survey of the Camden and Gloucester City area to investigate the possible presence of radioactive contamination. Based on an evaluation of these data, EPA divided the Welsbach Site into six study areas. The former Welsbach property, including the Armstrong Building, is located in Study Area 2.

In 1991, the New Jersey Department of Environmental Protection (NJDEP) conducted preliminary radiological investigations at over 1,000 properties located in Gloucester City and Camden within five of the six study areas. At properties where NJDEP identified exposure levels above their short-term remedial action level, NJDEP performed interim remedial measures including the installation of radon/thoron mitigation systems and/or the installation of shielding (soil, concrete, and/or lead). In 1996, EPA placed the Welsbach Site on the National Priorities List (NPL). The NPL is a list of the hazardous waste sites around the country that EPA has made eligible for cleanup under Superfund.

Armstrong Building History

From around 1915 to 1940, Welsbach used the Armstrong Building in the manufacturing of gas mantles. In 1942, after Welsbach went out of business, the United States government acquired the Welsbach property. The United States sold the Welsbach property to a company referred to as the Randall Corporation in 1948. The Randall Corporation leased the property to the Radio Corporation of America, Victor Division. A series of intervening owners followed and in 1976, Holt Hauling & Warehousing, Inc. (Holt) purchased the former Welsbach property and used the Armstrong Building for offices, warehousing operations, and storage. The Welsbach property is currently owned by GMT Realty LLC, which continues to use the 1st floor of the building for offices, warehousing operations, and storage, with a small portion of the 2nd floor used for offices and training.

Enforcement History

In May 1997, Holt, the former owner of the Armstrong Building property, voluntarily entered into an Administrative Order on Consent (AOC) with EPA to conduct a remedial investigation and feasibility study (RI/FS) for the Armstrong Building. Holt contracted with Integrated Environmental Management, Inc. (IEM) to conduct this investigation.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The 2011 Supplementary RI Report, 2011 FS, Proposed Plan, and supporting documentation for OU2, the Armstrong Building, were made available to the public on July 21, 2011. These documents were provided in the Administrative Record file and the information repositories maintained at:

1. **EPA Region 2 Records Center** - 290 Broadway, 18th Floor, New York, New York
2. **Camden Library –** Ferry Avenue Branch, 852 Ferry Avenue, Camden, New Jersey
3. **Gloucester City Public Library** - Monmouth and Hudson Streets, Gloucester City, New Jersey
4. **Heart of Camden Office** - 1840 Broadway, Camden, New Jersey

Notices of the availability of the Proposed Plan and the Administrative Record, the public comment period on the preferred remedy, the public meeting date, and EPA contact information were published in the *Courier-Post* on July 20, 2011 and the *Gloucester City News* on July 21, 2011.

The public comment period was held from July 21 to August 22, 2011. A public meeting was held on August 3, 2011 at the Gloucester City Courthouse at City Hall, 313 Monmouth Street, Gloucester City, New Jersey, to discuss the findings of the RI/FS and to present EPA's Proposed Plan to local officials and the community. At this meeting, EPA representatives presented an overview of the Welsbach Site and answered questions about the radioactive contamination in the Armstrong Building and the remedial alternatives under consideration. Comments received at the public meeting and in writing during the public comment period are addressed in the Responsiveness Summary (see Appendix III).

SCOPE AND ROLE OF OPERABLE UNIT

As with many Superfund sites, the contamination at the Welsbach Site is complex. In order to manage the cleanup of the Welsbach Site more effectively, EPA has organized the work into four phases or OUs.

The decision described in this document relates to the second of four planned OUs at the Welsbach Site. The July 1999 ROD for OU1 specified the demolition of the former GGM building, excavation of the radiologically contaminated soil and debris at the residential, commercial, and industrial properties at the Welsbach Site, and disposal of this material in a licensed off-site facility. The September 2005 ROD for OU3 identified that no remedial action was necessary for the surface water, sediment, and wetlands areas of the Welsbach Site.

This ROD addresses OU2, radioactive contamination in the Armstrong Building, the last remaining building from the Welsbach operations. EPA will address potential groundwater contamination (OU4) at the completion of the OU1 remedy.

SUMMARY OF SITE CHARACTERISTICS

The Armstrong Building consists of five connected sub-buildings containing approximately 200,000 square feet of floor space. It has three basement areas and three above-ground stories, and is constructed of masonry and reinforced concrete.

The building, which is more than 95 years old, is in generally good structural condition but in poor physical repair. Many of the exterior walls on the 2nd and 3rd floors, and the 3rd floor ceiling, are open to the environment. Due to the condition of the building, only a few rooms on the 1st and 2nd floors are currently being used for offices, warehousing operations, storage, and training. Refer to Figures 3 and 4 in Appendix II for the layouts of the 2nd and 3rd floors, respectively.

The following investigations, which are described in more detail below, have been conducted at the Armstrong Building.

- **1991 –** NJDEP conducted an investigation consisting of surface exposure rate and working level measurements
- **1998 –** IEM, on behalf of Holt, conducted an RI
- **2010 –** ARCADIS/Malcolm Pirnie, on behalf of EPA, conducted a supplementary RI

NJDEP Investigation

During its investigation, NJDEP detected elevated gamma radiation levels on the 2nd and 3rd floors of the Armstrong Building, and elevated Working Level measurements on the 2nd floor in Room 9 and on the 3rd floor in Rooms 15, 16, 17, 19, and 20. The exposure to radon and thoron decay products is expressed in terms of a specialized unit called the Working Level. No elevated gamma radiation, or radon and thoron gas, were detected on the 1st floor.

IEM Remedial Investigation

IEM divided the Armstrong Building into affected and unaffected areas based on NJDEP's results prior to conducting any field work. Affected areas were those areas where radioactive materials were likely to have been used, handled, or stored and/or areas identified by NJDEP as potentially contaminated. IEM conducted the following surveys/sampling during the RI.

- Radiation Scans - A floor monitor, calibrated to respond to alpha radiation, was used to scan potentially affected floor surfaces. Where practicable, a similar approach was used for the walls. In affected areas, all wall surfaces were scanned from the floor to a height of approximately six feet. Approximately ten percent of the wall areas higher than six feet were also randomly selected and scanned.
- Radiation Measurements - At floor or wall surfaces where the scanning found residual alpha radiation activity above the project criterion, more definitive measurements were obtained to confirm and quantify the level of alpha radiation.
- Horizontal Surface Samples/Radiation Measurements – For horizontal surfaces (*e.g.*, floors) with elevated readings, a sample was collected to determine the level of removable activity (*i.e.*, capable of spreading). A second alpha radiation measurement was collected at this location to determine the amount of contamination that is fixed in place (*i.e.*, cannot spread without disturbance).
- Building Material Samples - Samples of building materials (*e.g.*, concrete, brick), from depths of 1/8 inch, 0 to 1 inches, and 1 to 2 inches were collected for off-site laboratory analysis.

Due to accessibility issues and/or safety concerns, IEM did not investigate some areas of the Armstrong Building. These areas included:

- Portions of the basement filled with debris
- Areas on the 1st floor with concrete poured over the original floor
- Portions of the walls in Rooms 11, 12, 14, and 20 covered by insulation and other materials

- The base of two elevator shafts
- A below-grade pipe chase
- Exterior walls underneath floor drains
- The roof, including exhaust vents, and the ceiling in Rooms 21 and 22
- The connector walkway on the 3rd floor between Rooms 16 and 22, which was deemed structurally unsafe
- Painted areas on walls and columns, and areas under floor tiles, since IEM conducted alpha scans and alpha scans are ineffective on covered surfaces

Under the AOC, Holt submitted the following reports to EPA:

- **July 1998** - *Remedial Investigation Report for the Armstrong Building*
- **May 1999** - *Comparative Analysis of Remedial Alternatives*
- **January 2000** - *Baseline Risk Assessment for the Armstrong Building*
- **January 2000** - *Feasibility Study for the Armstrong Building*

<u>ARCADIS/Malcolm Pirnie Supplementary Remedial Investigation</u>

In 2010, ARCADIS/Malcolm Pirnie, under contract with the U.S. Army Corps of Engineers, conducted a supplementary RI at the Armstrong Building to fill some potential data gaps identified in IEM's RI/FS. The supplementary RI focused on the building material surfaces in a number of rooms on the 2nd and 3rd floors of the Armstrong Building, since both NJDEP and IEM did not find Welsbach-related radioactive contamination on the 1st floor. The purpose of this RI was to:

- Confirm IEM's radiological measurements and data collected on building surfaces in rooms on the 2nd and 3rd floors.
- Collect a limited amount of additional data to close some data gaps identified in IEM's investigation.
- Determine if IEM's data met the current data quality objectives of the project and, if so, use these data, together with the new data collected by ARCADIS/Malcolm Pirnie, to develop a new baseline human health risk assessment.
- Reevaluate the technologies and alternatives for remediating radioactive contamination, and associated costs, presented by IEM in its FS.

ARCADIS/Malcolm Pirnie conducted the following surveys/sampling during the supplementary RI.

- <u>Radiological Scans</u> - Beta and/or gamma radiation scans were conducted in limited areas (*e.g.*, at select locations or along transects on the floors and along transects, mainly up to a height of six feet, along the walls and columns).

- Radiation Measurements - On building surfaces where scans found residual beta or gamma radiation activity above the project criteria, more definitive measurements were collected to confirm and quantify the level of radiation.

- Horizontal Surface Samples - Samples were collected from select surfaces [*e.g.*, pipes; heating, ventilation, and air conditioning (HVAC) components] to determine the level of removable activity (*i.e.*, capable of spreading).

- Building Material Samples - Samples of building materials (*e.g.*, concrete, brick) were collected from depths of 0 to 1/8 inch and 1/8 to 1 inch for off-site laboratory analysis for specific radionuclides.

- Radon/Thoron Samples - Samples were collected for off-site laboratory analysis for radon/thoron in air.

ARCADIS/Malcolm Pirnie subsequently prepared the following reports based on data from IEM's RI and the supplementary RI:

- **July 2011** - *Supplementary Remedial Investigation Report OU 2: Armstrong Building*
- **July 2011** - *Feasibility Study OU 2: Armstrong Building*

Investigation Results

The IEM RI Report and 2011 Supplementary RI Report identified radioactive contamination in four rooms on the 2nd floor (Rooms 9, 10, 11, and 13) and eight rooms/areas on the 3rd floor (Rooms 15, 16, 17, 18, 19, 20, 21, and 22 and Area A). Radioactive contamination was also found in one stairway during the IEM RI. The RI investigations findings include:

- With the exception of Room 11, building material sample results indicated that radioactive contamination is predominantly due to thorium series radionuclides. The radioactive contamination in Room 11 appeared to be associated with radium-226 (Ra-226).

- With one exception, the building material sample results indicated that contamination of building materials is superficial (*i.e.*, contained within the top 1/8 inch of the surface). One volumetric floor sample from Room 11, collected to a depth of slightly greater than inch, had an elevated Ra-226 concentration.

- Building material contamination varied by room and location within a room and locations within a room were not uniformly contaminated.

- Limited removable contamination was found on the floors in Rooms 11, 13, 17, and 20 and only one location was identified by IEM as having elevated removable levels.

- Removable contamination was not detected on any of the top horizontal surfaces of the pipes and HVAC components sampled.

  Out of the 25 rooms sampled both radon and thoron were not-detected in 23 rooms. In one room, radon was found at 1.7 picoCuries per liter (pCi/L) while thoron was non-detected, and in another room thoron was found at 1.1 pCi/L while radon was not-detected.

A room-by-room summary of the IEM RI Report and 2011 Supplementary RI Report, including the presence of radioactive contamination (*i.e.*, unaffected vs. affected), the need for remedial action, and RI field measurements for rooms requiring remedial action, is provided in Table 1 in Appendix II.

CHARACTERISTICS OF THE RADIONUCLIDES OF CONCERN

A radionuclide is an element that spontaneously decays into another element through natural processes. The radioactive half-life describes the amount of time it takes half of the atoms in a radionuclide to decay. During this decay, the radionuclide emits energy in the form of alpha, beta, and/or gamma radiation.

An alpha particle is a relatively heavy, high energy particle that travels fairly slowly in air and loses energy rapidly. Alpha particles are unable to penetrate most matter they encounter, such as a piece of paper. Beta particles are faster and travel farther than alpha particles and are stopped by solid materials, such as wood. Gamma radiation is a very high energy form of radiation that travels extremely fast and can travel very far in air. Gamma radiation is able to pass through many materials and is only stopped by very dense matter, such as lead.

The primary radionuclides of concern at the Armstrong Building are thorium-232 (Th-232) and Ra-226. Th-232, which is in the thorium decay chain, decays by alpha emission, with accompanying gamma radiation, and has a half-life of 14 billion years. Radium-226, which is in the uranium decay chain, is an alpha emitter with a half-life of over 1,600 years. Therefore, radioactive decay does not contribute significantly toward their degradation in the environment because the half-lives are so long.

The gaseous decay product of thorium, Radon-220 or thoron gas, generally does not concentrate to any appreciable extent due to the short half-life (55 seconds). The immediate decay product of Ra-226, Radon-222 or radon gas, may become electrostatically attracted to respirable dust particles and can buildup in indoor air due to radon's longer half-life (3.8 days). It should be noted that analyses of radon/thoron samples collected during the supplementary RI, radon was only found in one sample and thoron was only found in one sample; both results were less than 2 pCi/L.

CURRENT AND POTENTIAL FUTURE SITE USES

The Armstrong Building is located on an active port facility that is privately secured. The closest residential property is approximately 400 feet east of the Armstrong Building, the Walt Whitman Bridge is located immediately north of the building, and the Delaware River is located approximately 1,000 feet to the west.

The Armstrong Building is currently owned by GMT Realty LLC. The majority of the building is no longer used, although a portion of the 1st floor is used for offices, warehousing operations, and storage, and a small portion of the 2nd floor is used for offices and training. At present, the property owner has indicated it is considering demolishing the building in the future.

The building, which is more than 95 years old, is in generally good structural condition but in poor physical repair. Many of the exterior walls on the 2nd and 3rd floors, and the 3rd floor ceiling are open to the environment. Some interior features have deteriorated due to water exposure and some of the brick and block exterior walls are crumbling. Several rooms on the 3rd floor where the ceiling has collapsed or where the roof is leaking have extensive water damage, and moss and some plants are growing in the water-damaged areas. In addition, wildlife (*e.g.*, rodents, feral cats, pigeons) live on portions of the 2nd and 3rd floors.

The primary factors affecting the fate and transport of radionuclides in buildings are structural integrity, physical and chemical properties of the contaminated surfaces, and the chemical properties of the isotopes. Radioactive contamination in the Armstrong Building could be released to the environment through either event-specific processes, such as collapse, fire, or demolition, or through gradual processes, such as airborne migration of particulates.

Since parts of the 2nd and 3rd floors of the Armstrong Building are in poor physical condition and deterioration of the building is expected to continue over time, it is expected that the threat of a release of radioactive contamination to the environment will continue to increase unless a remedial action is implemented.

SUMMARY OF SITE RISKS

Summary of Baseline Human Health Risk Assessment

As part of the 2011 Supplementary RI Report, EPA conducted a baseline human health risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk human health assessment for the Armstrong Building. Since OU2 involves contamination within a building, an ecological risk assessment was not conducted.

EPA uses a four step process to assess site-related human health risks for a reasonable maximum exposure scenario: *Data Evaluation (or Hazard Identification)* – uses the analytical data collected to identify the chemicals of potential concern at the site (in this case radionuclides of potential concern), with consideration of a number of factors explained below; *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (*e.g.*, inhalation of airborne dust) by which humans are potentially exposed; *Toxicity Assessment* - determines the types of adverse health effects associated with contaminant exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. For known or suspected carcinogens, the National Oil and Hazardous Substances Contingency Plan (NCP) established that acceptable exposure levels are generally concentration levels that represent an incremental upper-bound lifetime cancer risk in the range from 10^{-4} (*i.e.*, 1×10^{-4} or 1 in 10,000) to 10^{-6} (*i.e.*, 1×10^{-6} or 1 in

1,000,000) or less. Contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the site. Non-cancer toxicity values are not available for the radionuclides of concern identified for the Armstrong Building; therefore, non-cancer hazards were not evaluated quantitatively in the baseline human health risk assessment. Also included in this section is a discussion of the uncertainties associated with these risks.

<u>Data Evaluation</u>

In this step, the radionuclides of potential concern were identified based on a variety of factors such as frequency of occurrence, fate and transport in the environment, and radionuclide levels present. Based on the results of the baseline human health risk assessment, the following radionuclides of concern, along with their decay products, were identified for the Armstrong Building. These radionuclides are hazardous substances in accordance with NCP § 302.4.

- Th-232 in Rooms 9, 10, 13, 15, 17, 21, and Area A
- Ra-226 in Room 11

<u>Exposure Assessment</u>

Consistent with Superfund policy and guidance, the baseline human health risk assessment assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Armstrong Building. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

Potential receptors and exposure pathways were based on current and future land use, the physical condition of the building, and the radioactive contamination identified. The exposure routes were evaluated as appropriate for the potential receptors. A conceptual site model, which identifies the potential receptors and pathways, was developed to focus the baseline human health risk assessment and the identification and evaluation of remedial alternatives. The conceptual site model is provided in Table 2 in Appendix II.

<u>Toxicity Assessment</u>

Incremental lifetime cancer risk from exposure to radioactive contamination is the only health effect of concern at the Armstrong Building. EPA classifies all radionuclides as known human cancer causing agents (Group A carcinogens), hence cancer risk associated with the radiotoxicity is the primary concern. Cancer risk is estimated by multiplying an estimated dose by a slope factor that characterizes the relationship between dose and response. The resulting risk estimate is expressed as a unitless probability (*e.g.*, 2×10^{-5}, or 2 in 100,000) of an individual developing cancer. The unitless probability represents the incremental (or increased) lifetime cancer risk associated with the estimated dose above the background risk of developing cancer for the general population.

Risk Characterization

EPA identified and evaluated the following three primary threats to human health associated with the Armstrong Building.

1) **Catastrophic Release/General Public Exposure Scenario** - This scenario was modeled due to the deteriorated condition of the building and the potential for a catastrophic release of radioactive contamination to the environment through several mechanisms including fire or building collapse. Potential receptors included the general public in the vicinity of, and downwind of the building, with inhalation the primary route of exposure. Based on this evaluation, an incremental lifetime cancer risk near the upper bound of the risk range was estimated for a receptor on the adjacent Walt Whitman Bridge.

2) **Building Demolition Exposure Scenarios** - These scenarios were modeled because the current property owner has indicated that it is considering demolishing the building in the future. Potential receptors included demolition workers inside the building and hypothetical residents living in a residence built above buried debris from the demolished building. Potential exposure routes evaluated included external exposure, inhalation via radon/thoron and airborne dust, and ingestion. Based on this evaluation all risks were calculated to be within or near the upper bound of the risk range.

3) **Building Reuse/Occupational and Residential Exposure Scenarios** - These scenarios, which evaluated the potential for exposure to both indoor workers and residents, were modeled under the assumption that the building is renovated in the future for either commercial/industrial or residential use. These scenarios were evaluated because the radionuclides of potential concern, Th-232 and Ra-226, do not degrade significantly in the environment over time. Therefore, it is expected that radioactive contamination would be present in the building for well beyond the foreseeable future. Potential exposure routes evaluated included external exposure, inhalation via airborne dust and radon/thoron, and ingestion.

   As presented in Tables 3 and 4 in Appendix I, the following incremental lifetime cancer risks were estimated for these scenarios/receptors:

   - Future Indoor Workers: For all rooms except Room 11, the calculated risks were within or below the risk range. For Room 11 the calculated risk was 5 in 10,000 (5×10^{-4}), which is greater than the risk range.
   - Future Resident Adult:
     - For Rooms 11 and 17, the calculated risks were 3 in 1,000 (3×10^{-3}) and 6 in 10,000 (6×10^{-4}), respectively, which are greater than the risk range. These risk calculations are also presented in EPA's Risk Assessment Guidance for Superfund (RAGS) Part D format in Tables 5 and 6 in Appendix I.
     - For the following rooms, all risks were near the upper bound of the risk range:
       - Room 9 (3 in 10,000 or 3×10^{-4})
       - Room 10 (3 in 10,000 or 3×10^{-4})
       - Room 13 (2 in 10,000 or 2×10^{-4})

        - Room 15 (2 in 10,000 or 2 x 10^{-4})
        - Room 21 (3 in 10,000 or 3 x 10^{-4})
        - Area A (2 in 10,000 or 2 x 10^{-4})
    - For all other rooms and areas, the calculated risks were within EPA's risk range.
- Future Resident Child:
    - For Room 11, the calculated risk was 6 in 10,000 (6 x 10^{-4}), which is greater than the risk range. This risk calculation is also presented in EPA's RAGS Part D format in Table 7 in Appendix I.
    - For all other rooms and areas, the calculated risks were within EPA's risk range.

Rooms/areas on the 2nd and 3rd floors with estimated cancer risks above the risk range are shown on Figure 3 and Figure 4, respectively, in Appendix II.

Uncertainty Analyses

The procedures and estimates used to assess risks are subject to a wide variety of uncertainties. Overall, radiological risk assessments are conducted conservatively (*i.e.*, using assumptions and parameter values that tend toward over-prediction) to estimate upper-bound incremental lifetime cancer risks. The main sources of uncertainty include the following.

1. **Environmental Measurement, Sampling, and Analysis** - Uncertainty associated with environmental measurement is generally related to the appropriateness and limitations of the field survey instruments and the media being surveyed. For example, the accuracy of the fixed count measurement data collected during the supplementary RI are dependent on a variety of conditions including, but not limited to, the efficiency of the various detectors in measuring the specific radioactivity, the type and level of naturally-occurring background radioactivity in the building materials, the texture and porosity of the building material surfaces, and physical interferences (*e.g.*, cover materials, paint, dust). Uncertainty associated with environmental sampling is generally related to limitations in terms of the number and distribution of samples, while uncertainty associated with sample analysis is generally associated with systematic or random errors (*i.e.*, false positive or negative results).
2. **Fate and Transport Modeling –** Uncertainties in the exposure assessment are related to estimates of how often an individual would come in contact with the radionuclides of concern, the period of time over which such exposure would occur, and the models used to estimate the concentrations of the radionuclides of potential concern at the point of exposure, along with the models' ability to simulate radionuclide fate and transport.
3. **Toxicity Values** - Uncertainty associated with the cancer potency slope factors used to estimate incremental lifetime cancer risks is low, and their use generally results in over-estimates of the potential for adverse health effects.

Based on the radioactive contamination identified within building materials, current site conditions, and the results of the baseline human health risk assessment, the response action selected in this ROD is necessary to protect public health, welfare, and/or the environment from actual or threatened releases of contaminants into the environment.

REMEDIAL ACTION OBJECTIVES

This section defines the goals of the remedial action and identifies the remedial action objectives (RAOs) for radiologically contaminated building materials in the Armstrong Building. RAOs consist of quantitative goals for reducing human health and environmental risks and/or meeting established regulatory requirements at Superfund sites. The RAOs are identified based on site characterization data, human health risk assessment results, applicable or relevant and appropriate requirements (ARAR), and other relevant site information. The following RAOs were developed for the Armstrong Building.

- Prevent radiation exposure from radioactive contamination on building surfaces.
- Prevent future release of radioactive contamination from the Armstrong Building to the environment.

Based on the results of the baseline human health risk assessment, Rooms 9, 10, 11, 13, 15, 17, and 21 and Area A (see Figures 3 and 4, respectively, in Appendix II) will require remedial action. Additional area outside these rooms may be detected during remedial design or remedial action activities. To determine which building surfaces in the Armstrong Building require remediation, site-specific, risk-based Preliminary Remediation Goals (PRGs) were developed in the 2011 FS based on the building reuse/residential exposure scenario evaluated in the baseline human health risk assessment component of the 2011 Supplementary RI Report[a]. A PRG of 500 disintegrations per minute per 100 square centimeters (dpm/100 cm^2) was derived for Th-232 and a PRG of 1,000 dpm/100 cm^2 was derived for Ra-226. Each PRG was based on a target incremental lifetime cancer risk of 1×10^{-4}.

The more conservative Th-232 PRG of 500 dpm/100 cm^2, not including background, for both fixed and removable contamination[b], was selected as the Remediation Goal (RG) for the Armstrong Building.

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[a] In the FS, ARCADIS/Malcolm Pirnie evaluated two tools in developing PRGs for Armstrong Building, RESRAD-BUILD and the current online version of the EPA Preliminary Remediation Goals for Radionuclides in Buildings (BPRG) calculator (EPA 2009) (developed by the Oak Ridge National Laboratory). Based on this evaluation, it was determined that while RESRAD-BUILD and the BPRG calculator compare favorably, RESRAD-BUILD is better at modeling future use scenarios and allows the input of more site specific parameters. Therefore, RESRAD-BUILD was used to calculate the PRG for the Armstrong Building. Appendix A in the 2011 FS contains additional information regarding this evaluation.

[b] During the IEM RI, only limited removable contamination was identified. IEM collected more than 60 swipe samples from piping, window ledges, floors, and the roof, and only one sample was identified by IEM as having elevated removable levels; a swipe sample collected from the floor in Room 17 with an activity of 362 dpm/100 cm^2. During the ARCADIS/Malcolm Pirnie Supplementary RI, 15 swipe samples were collected from overhead piping and HVAC components and no removable contamination was detected in any of these samples. As a conservative measure, 10% removable contamination was assumed in the scenarios modeled in the baseline human health risk assessment. Wipe samples will be collected during the design investigation to verify that the removable contamination assumptions used to develop the RG are valid.

This RG was selected since the majority of the radiologically contaminated materials in the building are contaminated with Th-232, and alpha, beta, and gamma radiation scans, which are used to detect radiation on or within building surfaces, are not radionuclide-specific.

The selected remedy will meet the RAOs through the decontamination of building surfaces and off-site disposal of radiologically contaminated decontamination waste. Decontamination of building surfaces will eliminate the threat of physical migration of contaminants, as well as potential exposure through various pathways (*e.g.*, ingestion, inhalation, dermal contact, external gamma radiation). See Figures 5 to 11 in Appendix II for the approximate locations in each room/area in the Armstrong Building requiring remedial action for radioactive contamination above the RG.

DESCRIPTION OF ALTERNATIVES

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §9601 et seq., requires that each remedial alternative be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. In addition, CERCLA includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility or volume of hazardous substances.

CERCLA requires that if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, EPA must review the action no less than every five years after initiation of the action. The time frames below for construction do not include the time for remedial design or the time to procure contracts.

While CERCLA indicates that institutional controls (*e.g.*, a deed notice, an easement or a covenant) to limit the use of portions of a property may be required, institutional controls and engineering controls were not considered practical and sufficiently protective for the Armstrong Building due to the long half-life of the radionuclides of concern. Therefore, they were not evaluated past the screening of technologies in the 2011 FS.

The remedial alternatives evaluated in the 2011 FS are summarized below. A complete description of these remedial alternatives is included in the 2011 FS.

Alternative 1 – No Action

Estimated Capital Cost: $0

Estimated Annual Operation $ Maintenance (O&M) Cost: $0

Estimated Present Worth: $0

Estimated Construction Time Frame: None

Under CERCLA, a "No Action" alternative is evaluated for every Superfund site to provide a baseline for evaluating the remedial alternatives. In this alternative, the Armstrong Building would remain in its current condition without any provision for decontamination or engineering and/or institutional controls. Since the radioactive contamination would remain in the building, a review/reassessment of conditions at the building would be required at five-year intervals to determine if remedial action is required. This alternative would not be effective in preventing human exposure to radioactive contamination and, therefore, would not achieve the RAOs. Therefore, this alternative was not considered further.

Alternative 2 – Complete Decontamination (Physical and/or Chemical), Off-Site Disposal

Estimated Capital Cost: $3,500,000

Estimated Annual O&M Cost: $0

Estimated Present Worth: $3,500,000

Estimated Construction Time Frame: One Year

Under this alternative, building surfaces on the 2nd and 3rd floors of the Armstrong Building with radioactive contamination above the RG of 500 dpm/100 cm^2, not including background, would be decontaminated until levels below the RG are achieved using physical and/or chemical decontamination techniques. EPA would conduct Final Status Surveys (FSS) in each remediated room/area using the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) as a guide to demonstrate the effectiveness of the remedial action and to ensure that the RAOs are achieved. All waste materials from the decontamination process would be collected and sampled for radioactive contamination and landfill disposal parameters. Based on the analytical results, the wastes would be segregated into Unimportant Quantities of Source Material (UQSM) or UQSM-Resource Conservation and Recovery Act (RCRA) waste, and shipped off-site to a licensed and permitted disposal facility. The total waste volume was conservatively estimated to be 90 cubic yards (cy).

Because this alternative is expected to achieve the RG, and since hazardous substances, pollutants, or contaminants will not remain above levels that allow for unlimited use and unrestricted exposure, a five-year review would not be required.

Alternative 3 – Complete Demolition, Off-Site Disposal

Estimated Capital Cost: $103,000,000

Estimated Annual O&M Cost: $0

Estimated Present Worth: $103,000,000

Estimated Construction Time Frame: Less than Two Years

Under this remedial alternative, the above-ground building and superstructure of the Armstrong Building would be completely removed using selective, controlled demolition techniques.

Given the condition and construction of the Armstrong Building (brick and mortar walls from the early 20th century) and painted surfaces on walls and concrete columns, comprehensive lead-based paint and asbestos surveys and structural/demolition assessment would be required to accurately estimate demolition material quantities, waste streams, and demolition methods for the remedial design and construction.

Radiologically contaminated demolition debris would be disposed of off-site in accordance with CERLA § 121(d)(3) while non-radiologically contaminated materials would be disposed of off-site in accordance with all local, State, and federal requirements at a permitted landfill. During demolition, containment and monitoring measures to prevent migration of fugitive dust would be utilized. The total quantity of material for complete building demolition was estimated to be approximately 19,500 cy; 3,900 cy of radiologically contaminated material and 15,600 cy of non-radiologically contaminated waste.

Because this alternative is expected to achieve the RG, and since hazardous substances, pollutants, or contaminants will not remain above levels that allow for unlimited use and unrestricted exposure, a five-year review would not be required.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria. More complete discussions of the relative performance of the remedial alternatives are included in the 2011 FS.

Threshold Criteria - *The first two criteria are known as threshold criteria because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

1. **Overall Protection of Human Health and the Environment**
   Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Alternative 1 (No Action) would not achieve this criterion since radioactive contamination in the building would not be removed and the potential would remain for human exposure through a catastrophic release from the building, building demolition and burial of demolition debris, or reuse of the building.

Alternative 2 (Decontamination) and Alternative 3 (Demolition) would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through the removal of radioactive contamination from the Armstrong Building above the RG and disposal of the waste at a licensed off-site facility.

Because Alternative 1 (No Action) is not protective of human health and the environment, it was eliminated from consideration under the other eight criteria.

2. Compliance with ARARs

Section 121(d) of CERCLA (42 U.S.C. § 9621[d]), as amended and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and State environmental statutes or provides a basis for invoking a waiver.

Actions taken at any Superfund site must meet all ARARs of federal and State law or provide grounds for invoking a waiver of these requirements. These include chemical-specific, location-specific, and action-specific ARARs. Both Alternative 2 (Decontamination) and Alternative 3 (Demolition) comply with ARARs through the removal of radioactive contamination from the Armstrong Building above the RG and disposal of the waste at a licensed off-site facility.

See Table 8 in Appendix II for a listing of the ARARs for the Selected Remedy [Alternative 2 (Decontamination)].

Primary Balancing Criteria - *The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.*

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3. Long-term Effectiveness and Permanence

A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Both Alternative 2 (Decontamination) and Alternative 3 (Demolition) offer long-term protection of human health and the environment, and permanence, through the removal of radioactive contamination from the Armstrong Building above the RG and disposal of the waste at a licensed off-site facility.

4. Reduction of Toxicity, Mobility, or Volume of contaminants through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

There are some treatment technologies that may reduce mobility of radionuclides in soil (*e.g.*, stabilization), and reduce the volume of contaminated soil (*e.g.*, soil separation); however, these technologies are not implementable for building materials associated with the Armstrong Building. However, Alternative 2 (Decontamination) and Alternative 3 (Demolition) would reduce mobility through removal of radioactive from the Armstrong Building above the RG and disposal of the waste at a licensed off-site facility. With Alternative 2, there is a potential for increasing toxicity during chemical decontamination when radioactive contamination is concentrated or mixed with other wastes. For both alternatives, there is a potential for increasing mobility through dust generation or accidental spills/releases; however, these concerns can be addressed by proper implementation of engineering controls (*e.g.*, dust control) and material/waste handling procedures. There is also a potential for increasing the volume by introducing physical media or chemical solutions (Alternative 2) or through cross-contamination of uncontaminated building rubble (Alternative 3).

5. Short-term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 2 (Decontamination) would present a potential short-term risk to construction workers due to exposure to radioactive contamination and non-Welsbach related wastes, such as asbestos-containing materials (ACM). Alternative 2 would also present a potential short-term risk to the public due to the potential for accidents with trucks/trains transporting radiologically contaminated materials to an off-site disposal facility. The potential for exposure to workers would be reduced with appropriate use of personal protective equipment and proper implementation of engineering controls and material/waste handling procedures. Short-term exposure to the public would be minimal due to the limited amount of radiologically contaminated waste (90 cy) estimated to be removed off-site.

Alternative 3 (Demolition) would present a potential short-term risk to construction workers and to the public (*e.g.*, through generation of radiologically contaminated dust) during demolition activities due to exposure to radioactive contamination and non-Welsbach related wastes, such as ACM. Demolition would also potentially involve additional short-term worker exposure to radioactive contamination during screening of the demolition waste to segregate radioactive and non-radioactive waste streams. The potential for exposure to workers and the public would be reduced through proper implementation of engineering controls. Worker exposure would be further reduced through appropriate use of personal protective equipment and material and waste handling procedures. Alternative 3 would also present a potential short-term risk to the public due to the potential for accidents with trucks/trains transporting radiologically contaminated materials to an off-site disposal facility.

Because the remedial action under Alternative 2 would take about one year to complete, there would be less potential short-term risk to workers and the public than Alternative 3, which would take almost two years to compete. In addition, there would be significantly less truck traffic under Alternative 2 ; only 90 cy of waste is expected to be generated under Alternative 2 versus 19,500 cy of waste materials under Alternative 3.

6. **Implementability**
   Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

From a technical standpoint, both Alternative 2 (Decontamination) and Alternative 3 (Demolition) are implementable as experienced firms, personnel, and equipment are readily available and both alternatives use readily available, proven technologies. However, from a logistical standpoint, only Alternative 2 is readily implementable since the majority of work associated with Alternative 2 would occur inside the Armstrong Building, and only a limited area on the port facility would be needed for access and staging requirements. Logistically, Alternative 3 would be more difficult to implement since close coordination with the property owner/operator of the extremely active port facility would be necessary since the Armstrong Building is located near the entrance to the port facility. In addition, significant access/staging issues could arise due to the limited space on the property for handling, storing, processing, loading, and hauling of construction debris and radioactive waste generated during demolition.

7. **Cost**
   Includes estimated capital and operation and maintenance costs, and net present-worth values.

Alternative 3 (Demolition) would be significantly more expensive to implement than Alternative 2 (Decontamination). The estimated capital cost for Alternative 2, which involves removal of approximately 90 cy of radiologically contaminated building materials, is $3,500,000. The estimated capital cost for Alternative 3, which involves demolition of the Armstrong Building and disposal of approximately 15,600 cy of construction debris/building rubble and 3,900 cy of radioactive waste, is $103,000,000. There are no annual O&M costs for either alternative since all of the radioactive contamination above the RG would be removed and disposed of at an approved facility. The estimated present worth is the same as the estimated capital cost for both alternatives due to the short implementation periods for both Alternative 2 (one year) and Alternative 3 (less than two years).

Modifying Criteria - *The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the State or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

8. State Acceptance
Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the selected response measure.

The State of New Jersey, NJDEP concurs with EPA's Selected Remedy. The State's letter of concurrence is provided in Appendix V.

9. Community Acceptance
Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial alternatives proposed for the Armstrong Building. Comments received during the public comment period indicated that the public generally supports the Selected Remedy. Some written comments were received during the public comment period. One commenter suggested that EPA should have considered an additional remedial alternative, partial demolition of the Armstrong Building. The public's comments are summarized and addressed in the Responsiveness Summary, which is provided in Appendix III.

PRINCIPAL THREAT WASTES

Principal threat wastes are considered source materials, *i.e.*, materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or as a source for direct exposure. The NCP [40 CFR §300.430(a)(1)(iii)(A)] establishes an expectation that treatment will be used to address the principal threats posed by a site whenever practicable. The radioactive contamination detected on building surfaces in the Armstrong Building are not liquid, they do not contain high concentrations of toxic compounds, and are not high mobile materials; therefore, this contamination does not meet the criteria of a "principal threat waste", as set forth in the NCP.

SELECTED REMEDY

Based upon consideration of the results from the Armstrong Building investigations, the requirements of CERCLA, the detailed analysis of the response measures, and public comments, EPA has determined that Alternative 2 is the appropriate remedy for OU2 of the Welsbach Site since it best satisfies the requirements of CERCLA Section 121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR§300.430(e)(9). The major components of the Selected Remedy include:

- Decontamination (physical and/or chemical) of radiologically contaminated building surfaces in the Armstrong Building. Approximately 90 cy of radiologically contaminated building materials would be removed.
- Transportation of radiologically contaminated wastes generated during the remedial action to an approved off-site facility.

Radiologically contaminated building surfaces above the RG of 500 dpm/100 cm^2, not including background, on the 2nd and 3rd floors of the Armstrong Building will be decontaminated until levels below the RG are achieved using physical and/or chemical decontamination techniques. The decontamination wastes will be disposed of off-site in accordance with CERLA § 121(d)(3).

Prior to beginning the remedial action, EPA will conduct a remedial design investigation to determine if the inaccessible areas identified in the RI require remediation. Areas found to have radioactive contamination above the RG will be included in the remedial action. During the remedial design, EPA will evaluate various physical and chemical decontamination techniques for contaminated building surfaces to determine their effectiveness/applicability to the Armstrong Building. It is likely that chemical decontamination, if used, would only be effective on concrete floors since chemical decontamination is not effective on porous, painted, or glazed surfaces, and may mobilize radioactive or other contaminants when used for these media. Therefore, chemical decontamination may be used on building surfaces that are non-porous, and free of paint, tiles, and mastic. Physical decontamination methods would be effective on the concrete floors, walls, and columns.

EPA will perform an FSS in each remediated room/area using MARSSIM as a guide to demonstrate the effectiveness of the remedial action and to ensure that the RG is achieved. The FSS process would alleviate the need to conduct further radiological monitoring in the future and would allow the building to be released for unrestricted use once remediation is complete. Liquid wastes generated during chemical decontamination will be stabilized/solidified (*e.g.*, addition of Portland cement, lime, sand or other materials or chemicals). All waste materials from the decontamination process (*e.g.*, concrete, brick and mortar dusts, physical decontamination spent media (*e.g.*, grit, sand, shot), including the stabilized liquid mixtures will be collected and sampled for radioactive contaminants and landfill disposal parameters. Based on the analytical results, the wastes will be segregated into UQSM or UQSM- RCRA waste, and shipped off-site to a licensed and permitted disposal facility. The total waste volume was conservatively estimated to be 90 cy.

Based on the best available information regarding the anticipated scope of the remedial alternatives, EPA and the State of New Jersey believe the Selected Remedy provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria. EPA and NJDEP believe the Selected Remedy will be protective of human health and the environment, comply with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable.

Consistent with EPA Region 2's "Clean and Green" policy, EPA will evaluate the use of sustainable technologies and practices with respect to any remedial alternative selected for OU2.

STATUTORY DETERMINATIONS

As previously noted, CERCLA §121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. CERCLA Section 121(b)(1) also establishes a preference for remedial actions that employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA Section 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and State laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4). For the reasons discussed below, EPA has determined that the Selected Remedy meets the requirements of CERCLA Section 121.

Protection of Public Health and the Environment

The Selected Remedy will protect human health and the environment through the removal of radioactive contamination from building surfaces and disposal at a licensed off-site facility. Decontamination through removal of radioactive contamination on building surfaces will eliminate all significant human exposure risks from thorium and radium contamination in the Armstrong Building. Decontamination will also allow the release of the building to the property owner for unlimited use and unrestricted exposure. This action will result in the reduction of exposure levels to acceptable risk levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens. Implementation of the Selected Remedy will not pose unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

ARARs for the Selected Remedy are listed in Table 8 in Appendix II. At the completion of the response action, the Selected Remedy will meet the identified ARARs.

Cost-Effectiveness

EPA had determined that the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. EPA evaluated overall effectiveness by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; short-term effectiveness; and implementability). Overall effectiveness was then compared to costs to determine cost-effectiveness. The overall effectiveness of the Selected Remedy has been determined to be proportional to the costs, and the Selected Remedy; therefore, represents reasonable value for the money to be spent. The estimated present worth cost of the Selected Remedy is $3.5 million.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Armstrong Building. The Selected Remedy, which involves the removal of radioactive contamination on building surfaces and disposal at a licensed off-site facility, is a permanent solution that provides the best balance of trade-offs in terms of the five balancing criteria.

Preference for Treatment as a Principal Element

There are some treatment technologies that may reduce mobility of radionuclides in soil (*e.g.*, stabilization), and reduce the volume of contaminated soil (*e.g.*, soil separation); however, these technologies are not implementable for building materials associated with the Armstrong Building. Therefore, the statutory preference for treatment as a principle element cannot be met. Although the Selected Remedy will not reduce the mobility or volume or radionuclides through treatment, decontamination will reduce the mobility of radioactive contaminants by removal, off-site disposal, and management of these wastes at an approved landfill permitted to accept radioactive waste.

Five-Year Review Requirements

Five-Year Reviews will not be necessary since all radiologically contaminated building surfaces above the RG in the Armstrong Building will be removed through the implementation of the Selected Remedy. By meeting the Remediation Goal, the Armstrong Building will be released to the property owner for unlimited use and unrestricted exposure.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU2 at the Welsbach Site was released for public comment on July 21, 2011. The comment period closed on August 22, 2011. EPA reviewed all written and verbal comments submitted during the public comment period and determined that no significant changes to the remedy, as originally identified in the Proposed Plan were necessary.

APPENDIX I

TABLES

Table 1
Summary of Armstrong Building Rooms/Areas
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Room Number	**Affected / Unaffected as Determined by IEM[1]**	**Contamination Present at Levels Posing Unacceptable Health Risks and Above the Remediation Goal[2]**	**Average Radionuclide Normalized Surface Activity[3] (dpm/100 cm²)**					
			Floor	**West Wall**	**North Wall**	**East Wall**	**South Wall**	**Interior Columns**
2nd Floor								
8	Unaffected	No	Used to characterize background conditions					
9	Affected	**Yes**	**1340**	**1160**	**774**	**1040**	**1390**	**948**
10	Affected	**Yes**	**1850**	NA	**647**	**860**	**668**	**--**
11	Affected	**Yes**	**30700**	**2480**	**243000**	NA	281	**6826**
12	Unaffected	No	Used to characterize of background conditions					
12A	Not Mentioned	No	Not evaluated in baseline risk assessment in 2011 RI					
13	Affected	**Yes**	**1170**	**--**	**--**	**--**	98	**--**
14	Unaffected	No	Not evaluated in baseline risk assessment in 2011 RI					
Area B	Unaffected	No	Not evaluated in baseline risk assessment in 2011 RI					
3rd Floor								
15	Affected	**Yes**	**1390**	372	**--**	**--**	193	**1472**
16	Affected	No	422	313	658	205	3350	--
17	Affected	**Yes**	**3220**	**593**	481	190	**693**	**--**
18	Affected	No	466	287	--	319	144	--
19	Affected	No	208	--	--	395	--	--
20	Affected	No	318	--	--		--	--
21	Affected	**Yes**	**1550**	**1720**	**2080**	**1680**	**1780**	**--**
22	Affected	No	646	--	1220	825	1210	--
Area A	Affected	**Yes**	**904**	**1200**	**--**	**1380**	**--**	**851**

Notes:

1. The affected/unaffected status was assigned to a room by IEM to guide the RI; the affected/unaffected status is not an indication of whether a room requires remediation. Affected

Table 1
Summary of Armstrong Building Rooms/Areas
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

rooms are those rooms where IEM either determined radioactive materials were likely to have been used, handled, or stored and/or are areas identified by NJDEP as potentially contaminated.

2. Portions of the rooms/area in bold font were identified in the 2011 FS as requiring cleanup since some areas in these rooms have radiological contamination at levels that pose unacceptable health risks under the building reuse/residential exposure scenario per the criterion established in the National Contingency Plan (*i.e.*, "for known or suspected carcinogens, acceptable exposure levels are generally concentrations that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response and are above the Remediation Goal [*i.e.*, 500 disintegrations per minute per 100 square centimeters (dpm/100 cm^2)] for the Armstrong Building.
3. Average radionuclide normalized surface activity used in the 2011 RI to characterize baseline health risks. Surface activities in all rooms/areas except Room 11 were normalized to Thorium 232. Surface activities in Room 11 were normalized to Radium 226. Average surface activities greater than the Remedial Goal are shown in **bold** font.

NA = not applicable; there is no permanent wall separating Rooms 10 and 11.

Table 2
Conceptual Site Model
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Rationale for Selection or Exclusion of Exposure Pathway
Hypothetical future	Building materials	Surficial contamination on floors, walls, and interior columns on the 2nd and 3rd floors of the building	Nearby vicinity of the building	General public	Adults and children	Inhalation	The general public in the nearby vicinity of the Armstrong Building, including those traveling on the nearby Walt Whitman Bridge, could be exposed to radioactivity if some catastrophic event (*e.g.*, fire, building collapse) were to occur and release radioactive contamination to the ambient air.
						Submersion	
						Ground shine (external)	
						Re-suspension	
			Inside the building	Demolition workers	Adults	External exposure (source)	Demolition workers could be exposed to radioactive contamination in affected rooms/areas on the 2nd and 3rd floors of the building during demolition activities conducted from inside the building.
						Inhalation (indoor radon or thoron)	
						Inhalation (airborne dust)	
						External exposure (air submersion)	
						External exposure (deposited material)	
						Ingestion (removable radioactivity from source)	
			Over buried building debris	Residents	Adults and children	External exposure (source)	Residents could be exposed to radioactive contamination on building debris buried on property later developed for residential use.
						Inhalation (indoor radon or thoron)	
						Inhalation (dust)	
						Ingestion (soil)	
						Ingestion (plant food)	
						Ingestion (water)	

Table 2
Conceptual Site Model
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Rationale for Selection or Exclusion of Exposure Pathway
Hypothetical future	Building materials	Surficial contamination on floors, walls, and interior columns on the 2nd and 3rd floors of the building	Inside the building	Indoor Workers	Adults	External exposure (source)	Workers could be exposed to radioactive contamination if the building is renovated for commercial/industrial use.
						Inhalation (indoor radon or thoron)	
						Inhalation (dust)	
						External exposure (air submersion)	
						External exposure (deposited material)	
						Ingestion (deposited material)	
				Residents	Adults and children	External exposure (source)	Although residents could be exposed to radioactive contamination if the building is renovated for residential use, such renovation is considered unlikely. Nevertheless, evaluation of this scenario may provide a basis for unrestricted release of the building.
						Inhalation (indoor radon or thoron)	
						Inhalation (dust)	
						External exposure (air submersion)	
						External exposure (deposited material)	
						Ingestion (deposited material)	

Table 3
Summary of Incremental Lifetime Cancer Risks: Workers
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Room	Worker Population	Incremental Lifetime Cancer Risk[1]		
		Time Year 0	Time Year 13	Time Year 25
2nd Floor				
9	Worker	4E-05	4E-05	4E-05
	Adjacent Worker	2E-06	2E-06	2E-06
10	Worker	5E-05	5E-05	5E-05
	Adjacent Worker	2E-06	2E-06	2E-06
11	Worker	5E-04	5E-04	5E-04
	Adjacent Worker	2E-05	2E-05	2E-05
13	Worker	3E-05	3E-05	3E-05
	Adjacent Worker	4E-06	4E-06	4E-06
3rd Floor				
15	Worker	4E-05	4E-05	4E-05
	Adjacent Worker	9E-07	9E-07	9E-07
16	Worker	1E-05	1E-05	1E-05
	Adjacent Worker	4E-07	4E-07	4E-07
17	Worker	1E-04	1E-04	1E-04
	Adjacent Worker	5E-06	5E-06	5E-06
18	Worker	1E-05	1E-05	1E-05
	Adjacent Worker	8E-07	8E-07	8E-07
19	Worker	6E-06	6E-06	6E-06
	Adjacent Worker	7E-07	7E-07	7E-07
20	Worker	8E-06	8E-06	8E-06
	Adjacent Worker	4E-06	4E-06	4E-06
21	Worker	5E-05	5E-05	5E-05
	Adjacent Worker	7E-06	7E-06	7E-06
22	Worker	2E-05	2E-05	2E-05
	Adjacent Worker	2E-06	2E-06	2E-06
Area A	Worker	2E-05	2E-05	2E-05
	Adjacent Worker	5E-07	5E-07	5E-07

Room 11: Worker		
Exposure Route	**Cancer Risk**	**% of Total**
External	5E-04	96
Deposition	2E-08	0.004
Immersion	1E-10	0.00002
Inhalation	1E-06	0.2
Radon	2E-05	4
Ingestion	6E-07	0.1
Totals	5E-04	100

[1] For this evaluation, the 25 year exposure duration was started at three different times: Time Year 0, which represents the source activity when it was first measured by IEM in 1998; Time Year 13, which represents the source activity at present day (since the source activity from IEM's RI was measured in 1998, the evaluation time of 13 years allows for decay and in-growth up to the present day); and Time Year 25, which represents the source activity if the rooms remained vacant for another 12 years (occupancy would begin in 2023), allowing for additional decay and in-growth.

Table 4
Summary of Incremental Lifetime Cancer Risks: Resident Adults and Resident Children
OU 2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Room	Resident Adult Population	Incremental Lifetime Cancer Risk[1]		
		Time Year 0	Time Year 13	Time Year 25
2nd Floor				
9	Resident Adult	3E-04	3E-04	3E-04
	Adjacent Resident Adult	1E-04	1E-04	1E-04
10	Resident Adult	3E-04	3E-04	3E-04
	Adjacent Resident Adult	1E-05	1E-05	1E-05
11	Resident Adult	3E-03	3E-03	3E-03
	Adjacent Resident Adult	1E-04	1E-04	1E-04
13	Resident Adult	2E-04	2E-04	2E-04
	Adjacent Resident Adult	3E-05	3E-05	2E-05
3rd Floor				
15	Resident Adult	2E-04	2E-04	2E-04
	Adjacent Resident Adult	6E-06	5E-06	5E-06
16	Resident Adult	7E-05	7E-05	7E-05
	Adjacent Resident Adult	3E-06	3E-06	3E-06
17	Resident Adult	6E-04	6E-04	6E-04
	Adjacent Resident Adult	3E-05	3E-05	3E-05
18	Resident Adult	8E-05	8E-05	8E-05
	Adjacent Resident Adult	5E-06	5E-06	5E-06
19	Resident Adult	4E-05	4E-05	4E-05
	Adjacent Resident Adult	5E-06	5E-06	5E-06
20	Resident Adult	5E-05	5E-05	5E-05
	Adjacent Resident Adult	2E-05	2E-05	2E-05
21	Resident Adult	3E-04	3E-04	3E-04
	Adjacent Resident Adult	5E-05	5E-05	4E-05
22	Resident Adult	1E-04	1E-04	1E-04
	Adjacent Resident Adult	1E-05	1E-05	1E-05
Area A	Resident Adult	2E-04	1E-04	1E-04
	Adjacent Resident Adult	3E-06	3E-06	3E-06

Room 11: Resident Adult		
Exposure Route	**Cancer Risk**	**% of Total**
External	3E-03	96
Deposition	1E-07	0.004
Immersion	7E-10	0.00002
Inhalation	8E-06	0.3
Radon	1E-04	4
Ingestion	5E-06	0.2
Totals	3E-03	100

Room 17: Resident Adult		
Exposure Route	**Cancer Risk**	**% of Total**
External	4E-04	67
Deposition	1E-08	0.002
Immersion	7E-11	0.00001
Inhalation	8E-06	1
Thoron	2E-04	32
Ingestion	5E-07	0.1
Totals	6E-04	100

Room	Resident Child Population	Incremental Lifetime Cancer Risk[1]		
		Time Year 0	Time Year 13	Time Year 25
2nd Floor				
9	Resident Child	4E-05	4E-05	4E-05
	Adjacent Resident Child	1E-05	1E-05	1E-05
10	Resident Child	5E-05	5E-05	5E-05
	Adjacent Resident Child	3E-06	3E-06	3E-06
11	Resident Child	6E-04	6E-04	6E-04
	Adjacent Resident Child	2E-05	2E-05	2E-05
13	Resident Child	4E-05	3E-05	3E-05
	Adjacent Resident Child	5E-06	5E-06	5E-06
3rd Floor				
15	Resident Child	4E-05	4E-05	4E-05
	Adjacent Resident Child	1E-06	1E-06	1E-06
16	Resident Child	1E-05	1E-05	1E-05
	Adjacent Resident Child	6E-07	6E-07	5E-07
17	Resident Child	1E-04	1E-04	1E-04
	Adjacent Resident Child	7E-06	7E-06	7E-06
18	Resident Child	1E-05	1E-05	1E-05
	Adjacent Resident Child	1E-06	1E-06	1E-06
19	Resident Child	6E-06	6E-06	6E-06
	Adjacent Resident Child	9E-07	9E-07	9E-07
20	Resident Child	8E-06	7E-06	7E-06
	Adjacent Resident Child	3E-06	3E-06	3E-06
21	Resident Child	5E-05	5E-05	5E-05
	Adjacent Resident Child	9E-06	9E-06	9E-06
22	Resident Child	2E-05	2E-05	2E-05
	Adjacent Resident Child	3E-06	3E-06	3E-06
Area A	Resident Child	2E-05	2E-05	2E-05
	Adjacent Resident Child	6E-07	6E-07	6E-07

Room 11: Resident Child		
Exposure Route	**Cancer Risk**	**% of Total**
External	6E-04	98
Deposition	3E-08	0.004
Immersion	1E-10	0.00002
Inhalation	9E-07	0.1
Radon	1E-05	2
Ingestion	2E-06	0.3
Totals	6E-04	100

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[1] For this evaluation, the 30 year exposure duration for the adult (24 years + 6 years) and the 6 year exposure duration for the child was started at three different times: Time Year 0, which represents the source activity when it was first measured by IEM in 1998; Time Year 13, which represents the source activity at present day (since the source activity from IEM's RI was measured in 1998, the evaluation time of 13 years allows for decay and in-growth up to the present day); and Time Year 25, which represents the source activity if the rooms remained vacant for another 12 years (occupancy would begin in 2023), allowing for additional decay and in-growth.

Table 5

Calculation of Radiation Cancer Risks - Building Reuse/Residential Scenario - Resident Adult – Room 11
Reasonable Maximum Exposure
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Scenario Timeframe: Building Reuse
Receptor Population: Resident (Affected Room)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Radionuclide of Potential Concern	EPC		Risk Calculation Approach	Cancer Risk Calculations [1]				
					Value	Units		Intake/Activity		CSF		Cancer Risk
								Value	Units	Value	Units	
Room 11	Concrete, Brick	Floors	External	Source 1 - Floor			RESRAD-BUILD Ver. 3.5					
Building Materials		Walls	Deposition	Po-210	3.07E+06	dpm/m^2		--		--		5E-05
		Interior Columns	Immersion	Ra-226	3.07E+06	dpm/m^2		--		--		3E-03
			Inhalation	Pb-210	3.07E+06	dpm/m^2		--		--		1E-05
			Radon	Source 2 - West Wall								
			Ingestion	Po-210	2.48E+05	dpm/m^2		--		--		3E-08
				Ra-226	2.48E+05	dpm/m^2		--		--		2E-06
				Pb-210	2.48E+05	dpm/m^2		--		--		1E-08
				Source 3 - North Wall								
				Po-210	2.43E+07	dpm/m^2		--		--		6E-06
				Ra-226	2.43E+07	dpm/m^2		--		--		3E-04
				Pb-210	2.43E+07	dpm/m^2		--		--		2E-06
				Source 4 - South Wall								
				Po-210	2.81E+04	dpm/m^2		--		--		5E-09
				Ra-226	2.81E+04	dpm/m^2		--		--		3E-07
				Pb-210	2.81E+04	dpm/m^2		--		--		2E-09
				Source 5 - Interior Column 1								
				Po-210	8.90E+05	dpm/m^2		--		--		8E-07
				Ra-226	8.90E+05	dpm/m^2		--		--		4E-05
				Pb-210	8.90E+05	dpm/m^2		--		--		2E-07
				Source 6 - Interior Column 2								
				Po-210	6.37E+05	dpm/m^2		--		--		8E-08
				Ra-226	6.37E+05	dpm/m^2		--		--		4E-06
				Pb-210	6.37E+05	dpm/m^2		--		--		2E-08
			Exp. Route Total									3E-03
		Exposure Point Total										3E-03
	Exposure Medium Total											3E-03
Medium Total												3E-03

Total of Receptor Risks Across All Media: 3E-03

Notes:
1 Cancer risks were estimated at time zero based on intakes for each source/exposure route (in dpm) and radionuclide/exposure route-specific 2001 HEAST cancer slope factors (CSF) (morbidity) (in risk/dpm).

Table 6

Calculation of Radiation Cancer Risks - Building Reuse/Residential Scenario – Resident Adult – Room 17

Reasonable Maximum Exposure

OU2: Armstrong Building

Welsbach/GGM Contamination Superfund Site

Scenario Timeframe: Building Reuse
Receptor Population: Resident (Affected Room)
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Radionuclide of Potential Concern	EPC		Risk Calculation Approach	Cancer Risk Calculations [1]				
					Value	Units		Intake/Activity		CSF		Cancer Risk
								Value	Units	Value	Units	
Room 17	Concrete, Brick	Floors	External	Source 1 - Floor			RESRAD-BUILD Ver. 3.5					
Building Materials		Walls	Deposition	Th-232	3.22E+05	dpm/m2		--		--		2E-06
			Immersion	Th-228	3.22E+05	dpm/m2		--		--		4E-04
			Inhalation	Ra-228	3.22E+05	dpm/m2		--		--		2E-04
			Radon	Source 2 - West Wall								
			Ingestion	Th-232	5.93E+04	dpm/m2		--		--		6E-09
				Th-228	5.93E+04	dpm/m2		--		--		7E-07
				Ra-228	5.93E+04	dpm/m2		--		--		9E-08
				Source 3 - North Wall								
				Th-232	4.81E+04	dpm/m2		--		--		1E-08
				Th-228	4.81E+04	dpm/m2		--		--		2E-06
				Ra-228	4.81E+04	dpm/m2		--		--		4E-07
				Source 4 - East Wall								
				Th-232	1.90E+04	dpm/m2		--		--		2E-09
				Th-228	1.90E+04	dpm/m2		--		--		2E-07
				Ra-228	1.90E+04	dpm/m2		--		--		1E-08
				Source 5 - South Wall								
				Th-232	6.93E+04	dpm/m2		--		--		2E-08
				Th-228	6.93E+04	dpm/m2		--		--		2E-06
				Ra-228	6.93E+04	dpm/m2		--		--		5E-07
			Exp. Route Total									6E-04
		Exposure Point Total										6E-04
	Exposure Medium Total											6E-04
Medium Total												6E-04

Total of Receptor Risks Across All Media	6E-04

Notes:

1 Cancer risks were estimated at time zero based on intakes for each source/exposure route (in dpm) and radionuclide/exposure route-specific 2001 HEAST cancer slope factors (CSF) (morbidity) (in risk/dpm).

TABLE 7

Calculation of Radiation Cancer Risks - Building Reuse/Residential Scenario – Resident Child – Room 11

Reasonable Maximum Exposure

OU2: Armstrong Building

Welsbach/GGM Contamination Superfund Site

Scenario Timeframe: Building Reuse
Receptor Population: Resident (Affected Room)
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Radionuclide of Potential Concern	EPC Value	EPC Units	Risk Calculation Approach	Cancer Risk Calculations [1] Intake/Activity Value	Intake/Activity Units	CSF Value	CSF Units	Cancer Risk
Room 11	Concrete, Brick	Floors	External	Source 1 - Floor			RESRAD-BUILD Ver. 3.5					
Building Materials		Walls	Deposition	Po-210	3.07E+06	dpm/m2		--		--		3E-05
		Interior Columns	Immersion	Ra-226	3.07E+06	dpm/m2		--		--		5E-04
			Inhalation	Pb-210	3.07E+06	dpm/m2		--		--		3E-06
			Radon	Source 2 - West Wall								
			Ingestion	Po-210	2.48E+05	dpm/m2		--		--		2E-08
				Ra-226	2.48E+05	dpm/m2		--		--		3E-07
				Pb-210	2.48E+05	dpm/m2		--		--		3E-09
				Source 3 - North Wall								
				Po-210	2.43E+07	dpm/m2		--		--		3E-06
				Ra-226	2.43E+07	dpm/m2		--		--		6E-05
				Pb-210	2.43E+07	dpm/m2		--		--		5E-07
				Source 4 - South Wall								
				Po-210	2.81E+04	dpm/m2		--		--		3E-09
				Ra-226	2.81E+04	dpm/m2		--		--		5E-08
				Pb-210	2.81E+04	dpm/m2		--		--		5E-10
				Source 5 - Interior Column 1								
				Po-210	8.90E+05	dpm/m2		--		--		4E-07
				Ra-226	8.90E+05	dpm/m2		--		--		8E-06
				Pb-210	8.90E+05	dpm/m2		--		--		3E-08
				Source 6 - Interior Column 2								
				Po-210	6.37E+05	dpm/m2		--		--		4E-08
				Ra-226	6.37E+05	dpm/m2		--		--		7E-07
				Pb-210	6.37E+05	dpm/m2		--		--		3E-09
			Exp. Route Total									6E-04
		Exposure Point Total										6E-04
	Exposure Medium Total											6E-04
Medium Total												6E-04

Total of Receptor Risks Across All Media: 6E-04

Notes:

1 Cancer risks were estimated at time zero based on intakes for each source/exposure route (in dpm) and radionuclide/exposure route-specific 2001 HEAST cancer slope factors (CSF) (morbidity) (in risk/dpm).

Table 8
Applicable and Relevant and Appropriate Requirements for the Selected Remedy
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Regulatory Authority	Requirement	Status	Synopsis of Requirement
Chemical-Specific			
federal	40 CFR, Subpart M 61.145 and 61.150, Protection of Environment, National Emission Standard for Hazardous Air Pollutants (NESHAP), National Emission Standard for Asbestos, Standard for Demolition and Renovation and Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations, respectively	Applicable	Standard for renovation/demolition of, and waste disposal for, asbestos containing materials (ACM) for manufacturing, fabricating, demolition, renovation, and spraying operations.
federal	40 CFR 261 Subpart C, Protection of Environment, Characteristics of Hazardous Waste	Relevant and Appropriate	Sets forth methods to determine if waste is a Resource Conservation and Recovery Act (RCRA) listed hazardous waste. For OU2 this applies to disposal of waste containing lead-based paint (LBP).
State	N.J.A.C. 7:26-2.12, Solid Waste Regulations, Generator Requirements for Disposal of Asbestos Containing Waste Materials	Relevant and Appropriate	Disposal of regulated ACM wastes.
federal	40 CFR, Subpart E - Residential Property Renovation, Chapter 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures, §745.85, Work Practice Standards	To Be Considered	Work practice standards.
federal	40 CFR 192.12(b)(1) and 192.41, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites and Provisions	To Be Considered	For the management of uranium byproduct materials, indicates that radon decay product concentrations, including background, should not exceed 0.02 working levels.

Table 8
Applicable and Relevant and Appropriate Requirements for the Selected Remedy
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Regulatory Authority	Requirement	Status	Synopsis of Requirement
State	New Jersey Department of Environmental Protection (NJDEP) Guidance on Lead-based Paint Abatement Debris Disposal (Updated 01/13/2004)	To Be Considered	
State	NJDEP Guidance Document for the Management of Asbestos-containing Material (Updated 06/17/2009).	To Be Considered	
federal	10 CFR 20 §20.1003, Standards for Protection Against Radiation, Definitions	To Be Considered	Radioactive waste at the former Welsbach facility is considered to be both naturally-occurring radioactive material and "by-product" material which is defined as "the tailings of wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content".
Action-Specific			
federal	10 CFR 20.2002, Method for Obtaining Approval of Proposed Disposal Procedures	Applicable	Establishes alternative disposal methods and facilities for low level activity radioactive waste.

Table 8
Applicable and Relevant and Appropriate Requirements for the Selected Remedy
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Regulatory Authority	Requirement	Status	Synopsis of Requirement
federal	40 CFR 300, Subpart E, Protection of Environment, National Oil and Hazardous Substances Pollution Contingency Plan, Hazardous Substance Response, Remedial Investigation/Feasibility Study and Selection of Remedy	Applicable	NCP requirement that "remediation goals shall establish acceptable exposure levels that are protective of human health and the environment" [§300.430(e)(2)(i)] and that "for known or suspected carcinogens, acceptable exposure levels are generally concentrations that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response" [§300.430(e)(2)(i)(A)(2)].
federal	49 CFR 171-173, General Information, Regulations, and Definitions; Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements; Shippers--general requirements for shipments and packagings	Applicable	U.S. Department of Transportation regulations governing all modes of hazardous materials transportation, including packing, repacking, handling, labeling, marking, placarding, and routing.
federal	29 CFR 1910, Occupational Safety and Health Standards	Applicable	Radiation exposure for occupational workers, specifically regarding ionizing radiation (§1910.1096).
federal	40 CFR, Subpart M 61.145, Protection of Environment, NESHAP, National Emission Standard for Asbestos, Standard for Demolition and Renovation	Applicable	Requires that the notification and description of the work practices and engineering controls to be used comply with the requirements of the asbestos NESHAP including asbestos removal and waste handling emission control procedures.

Table 8
Applicable and Relevant and Appropriate Requirements for the Selected Remedy
OU2: Armstrong Building
Welsbach/GGM Contamination Superfund Site

Regulatory Authority	Requirement	Status	Synopsis of Requirement
federal	40 CFR Part 262, Protection of Environment, Standards Applicable to Generators of Hazardous Waste	Applicable	Transportation of hazardous wastes, if the toxicity characteristic of the LBP debris makes it a characteristic hazardous waste.
federal	40 CFR Part 268, Protection of Environment, Land Disposal Restrictions	Applicable	Land disposal restrictions related to the disposal of LBP materials/debris as a characteristic hazardous waste.
State	N.J.A.C. 7:26-3.5, Transporter Requirements (specific)	Applicable	Requirements for the transportation of ACM.
federal	EPA, 1997: OSWER Directive No. 9200.4-18 Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination	To Be Considered	Indicates that if a dose assessment is conducted, a 15 millirem/year effective dose equivalent (EDE) should generally be the maximum dose limit for humans.
federal	10 CFR Part 20, Nuclear Regulatory Commission Regulations, Standards for Protection Against Radiation, 50, 51, 70, and 72	To Be Considered	
State	N.J.A.C. 7:28, Radiation Protection Programs	To Be Considered	Incorporates by reference 10 CFR Part 20.

APPENDIX II

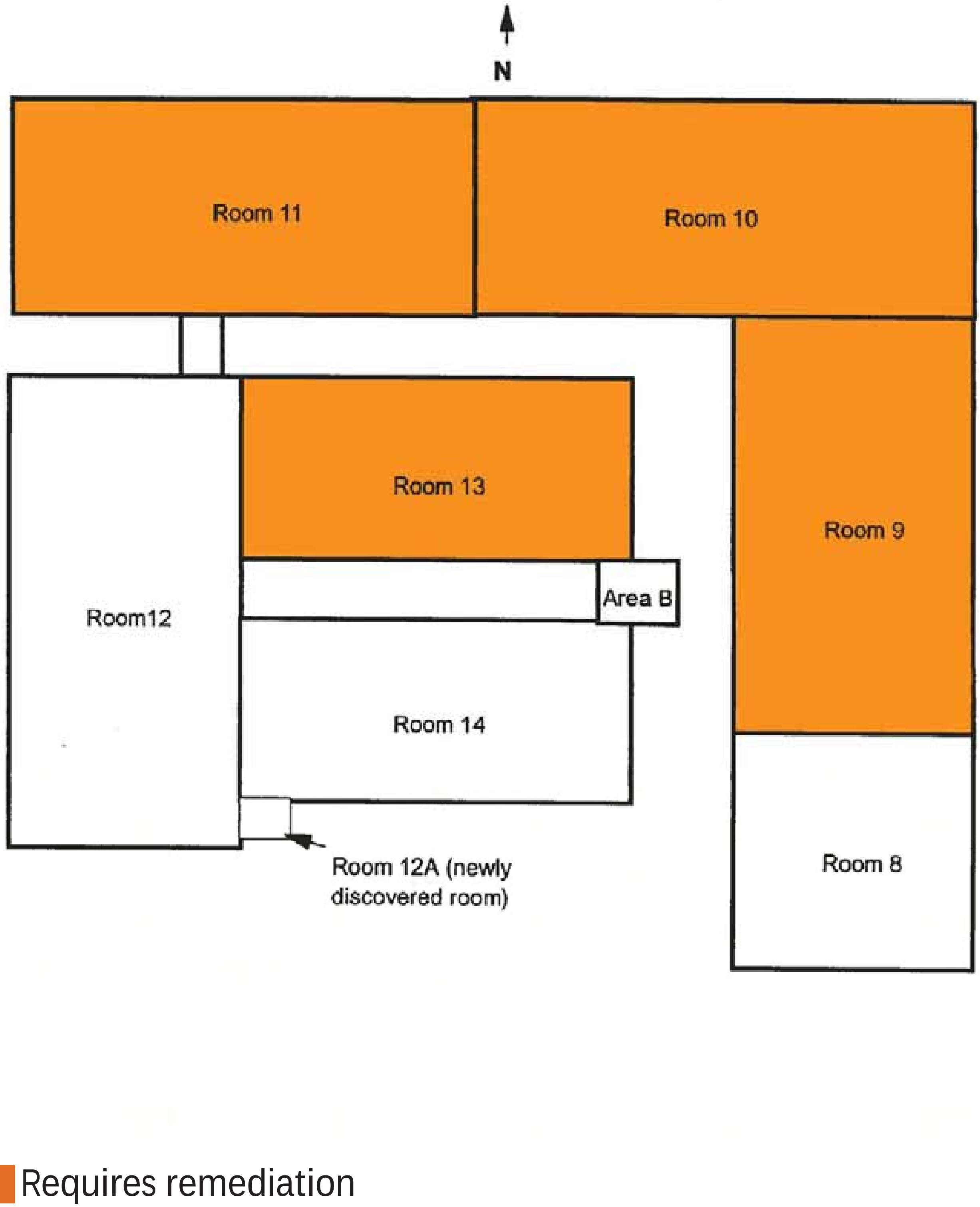
FIGURES

ARMSTRONG BUILDING & SITE STUDY AREAS
OU2: ARMSTRONG BUILDING
WELSBACH/GGM CONTAMINATION SUPERFUND SITE

FIGURE 1

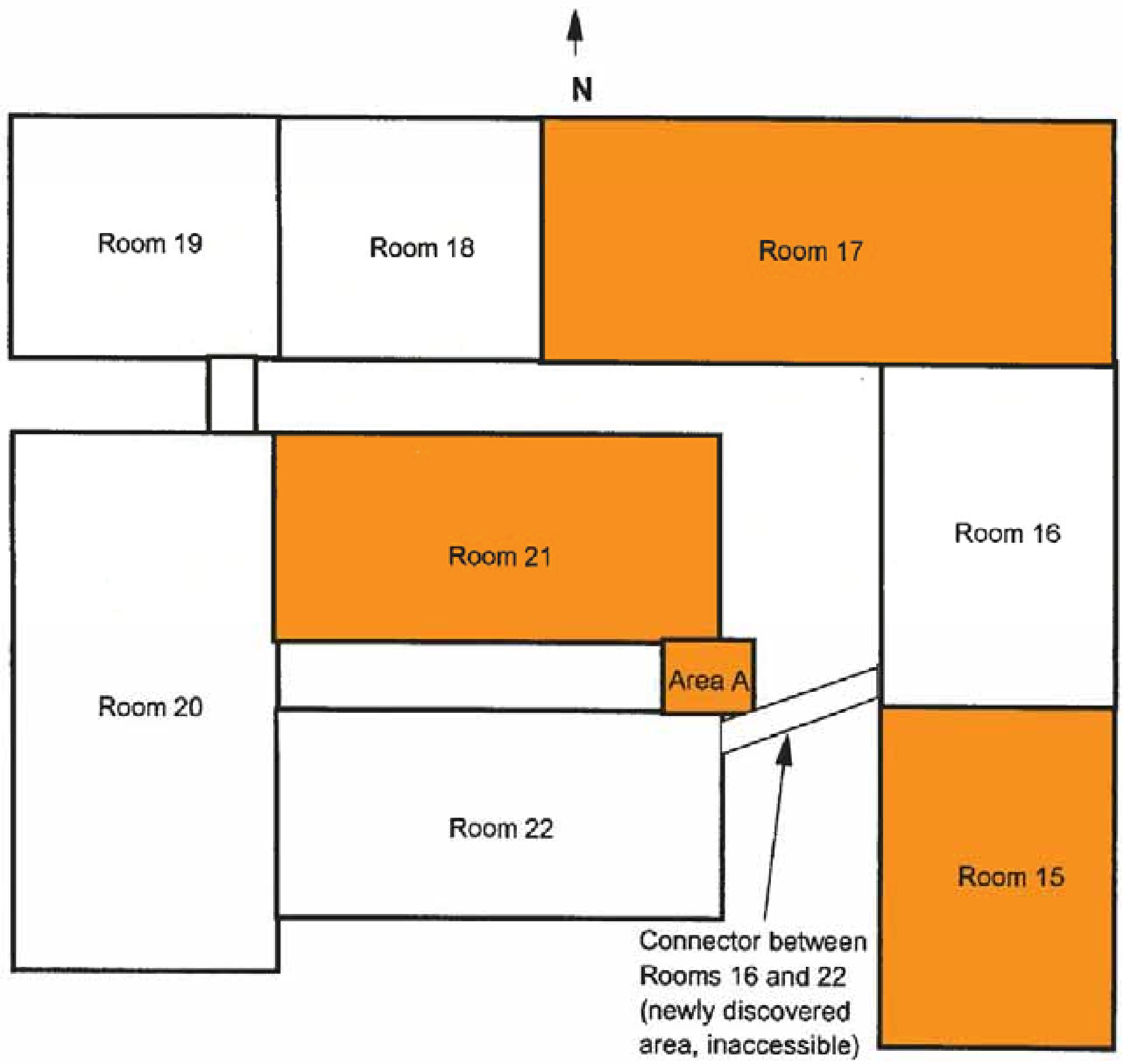
ARMSTRONG BUILDING LOCATION
OU2: ARMSTRONG BUILDING
WELSBACH/GGM CONTAMINATION SUPERFUND SITE

FIGURE 2



Note: Only portions of the outlined rooms require remediation

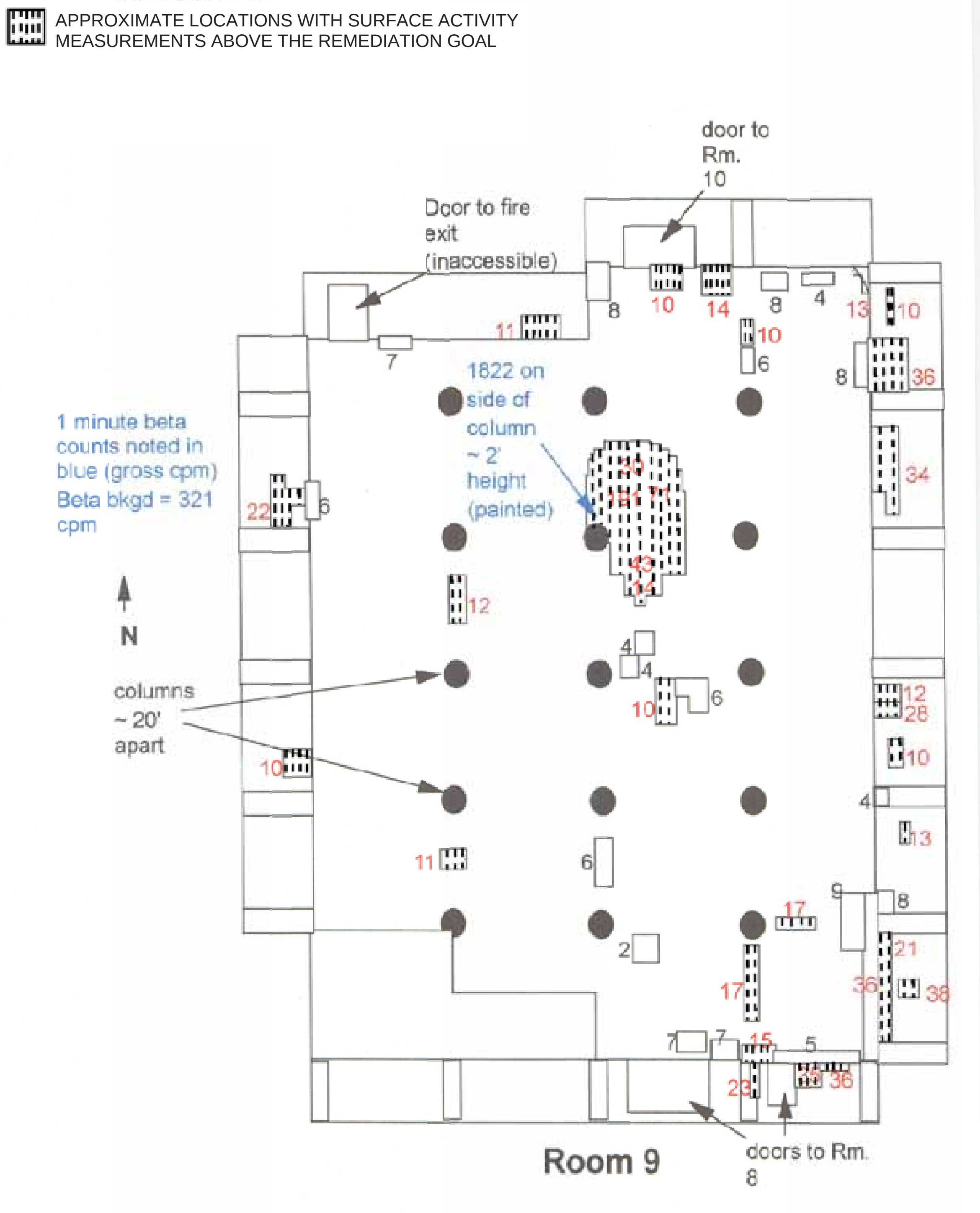
ARMSTRONG BUILDING - SECOND FLOOR LAYOUT/ROOM NUMBERING OU2: ARMSTRONG BUILDING WELSBACH/GGM CONTAMINATION SUPERFUND SITE	FIGURE 3



Requires remediation

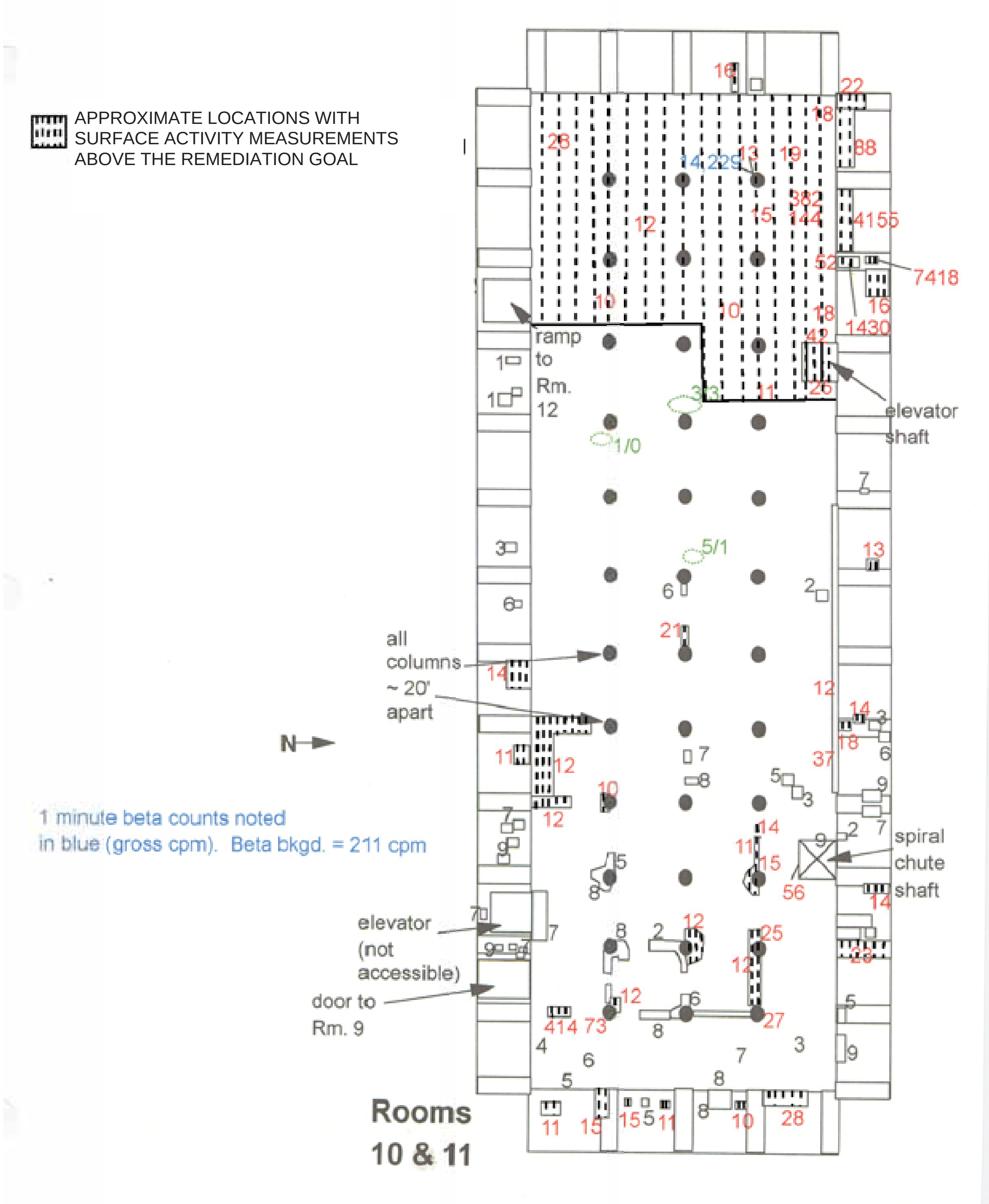
Note: Only portions of the outlined rooms require remediation

ARMSTRONG BUILDING - THIRD FLOOR LAYOUT/ROOM NUMBERING OU2: ARMSTRONG BUILDING WELSBACH/GGM CONTAMINATION SUPERFUND SITE	FIGURE 4



Adapted from IEM RI Report (July 1998)

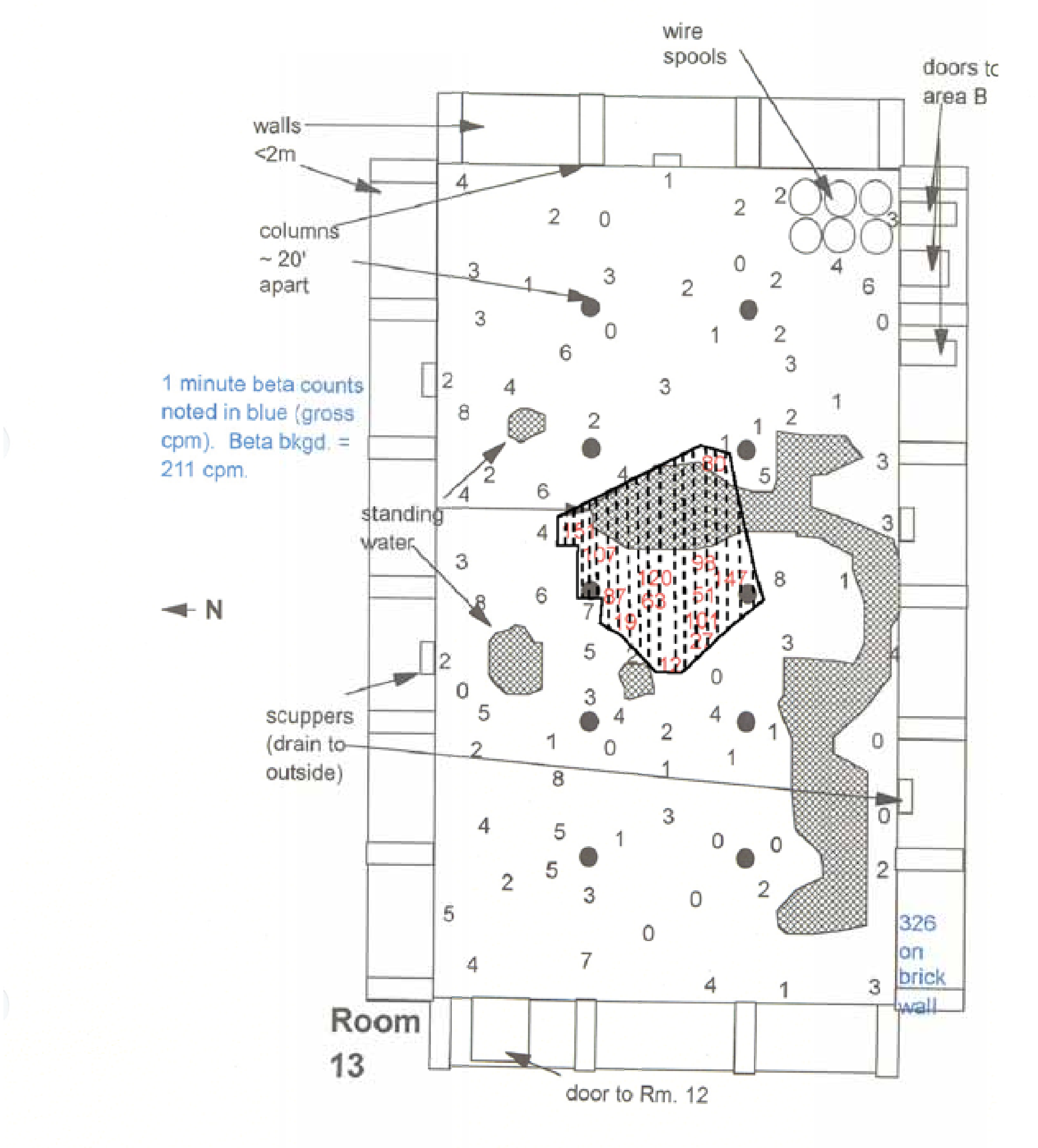
POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOM 9 OU2: ARMSTRONG BUILDING WELSBACH/GGM CONTAMINATION SUPERFUND SITE	FIGURE 5



Adapted from IEM RI Report (July 1998)

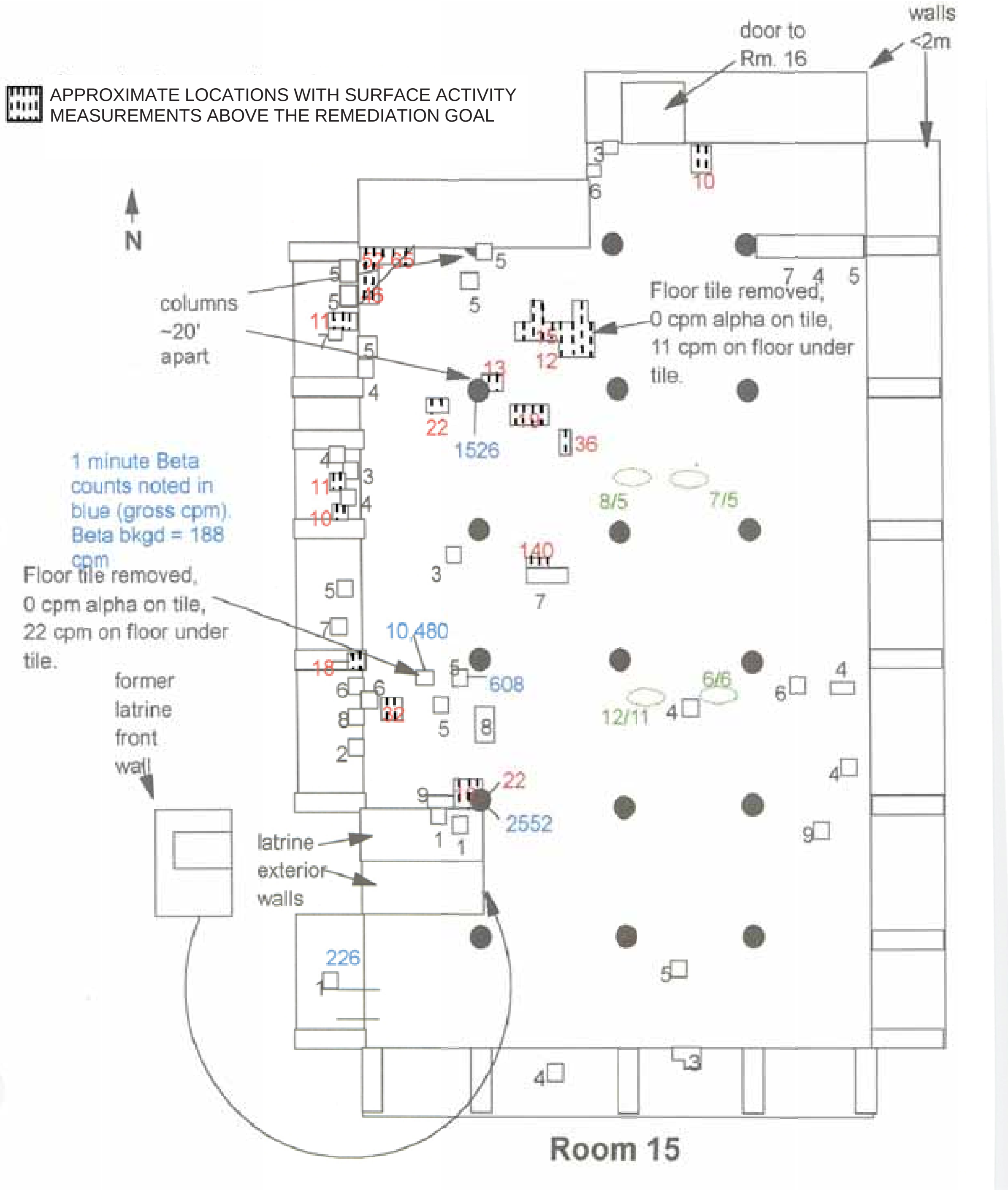
POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOMS 10 & 11 **OU2: ARMSTRONG BUILDING** **WELSBACH/GGM CONTAMINATION SUPERFUND SITE**	**FIGURE 6**

APPROXIMATE LOCATIONS WITH SURFACE ACTIVITY MEASUREMENTS ABOVE THE REMEDIATION GOAL



Adapted from IEM RI Report (July 1998)

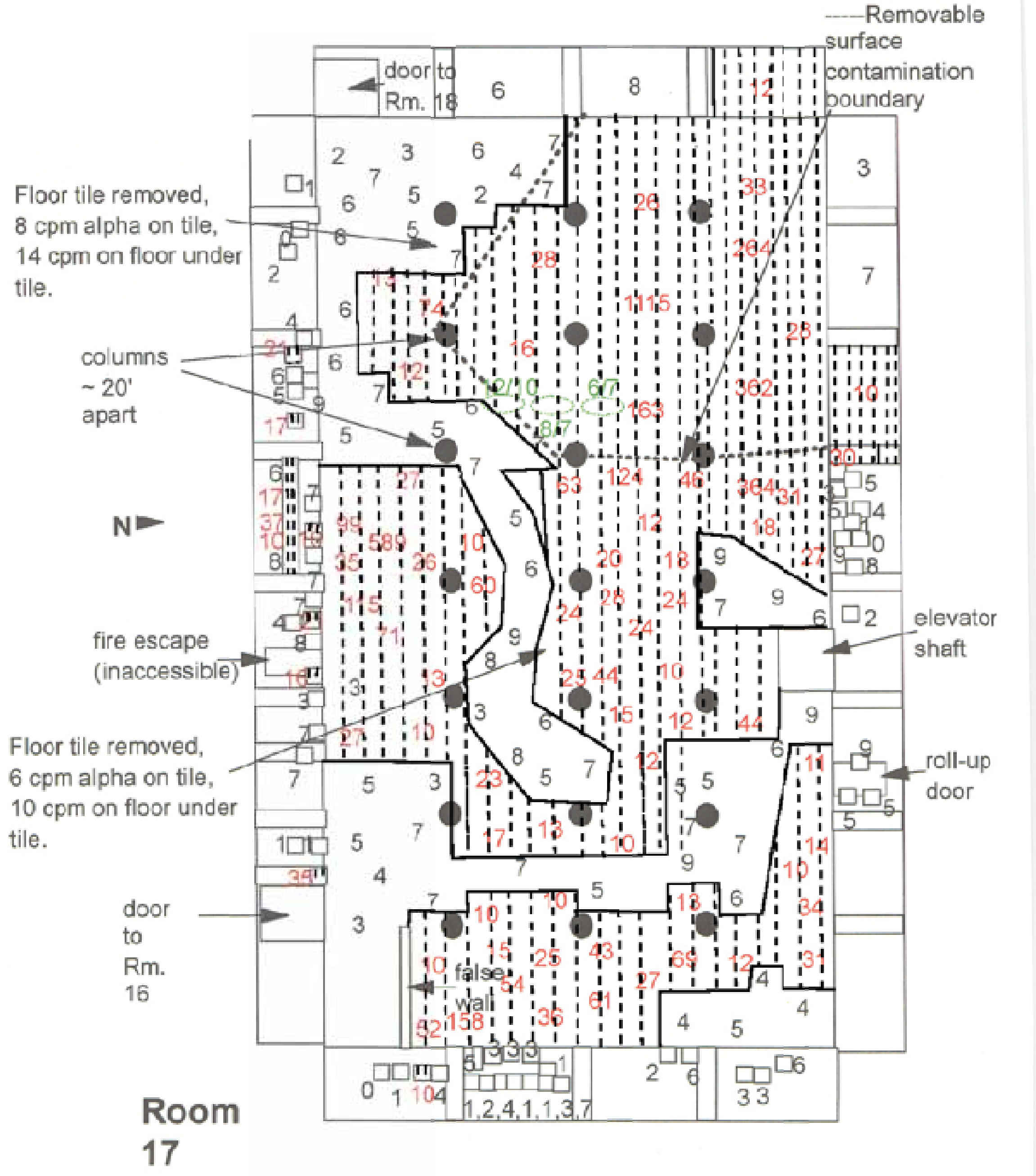
POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOM 13 **OU2: ARMSTRONG BUILDING** **WELSBACH/GGM CONTAMINATION SUPERFUND SITE**	**FIGURE 7**



Adapted from IEM RI Report (July 1998)

POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOM 15 OU2: ARMSTRONG BUILDING WELSBACH/GGM CONTAMINATION SUPERFUND SITE	FIGURE 8

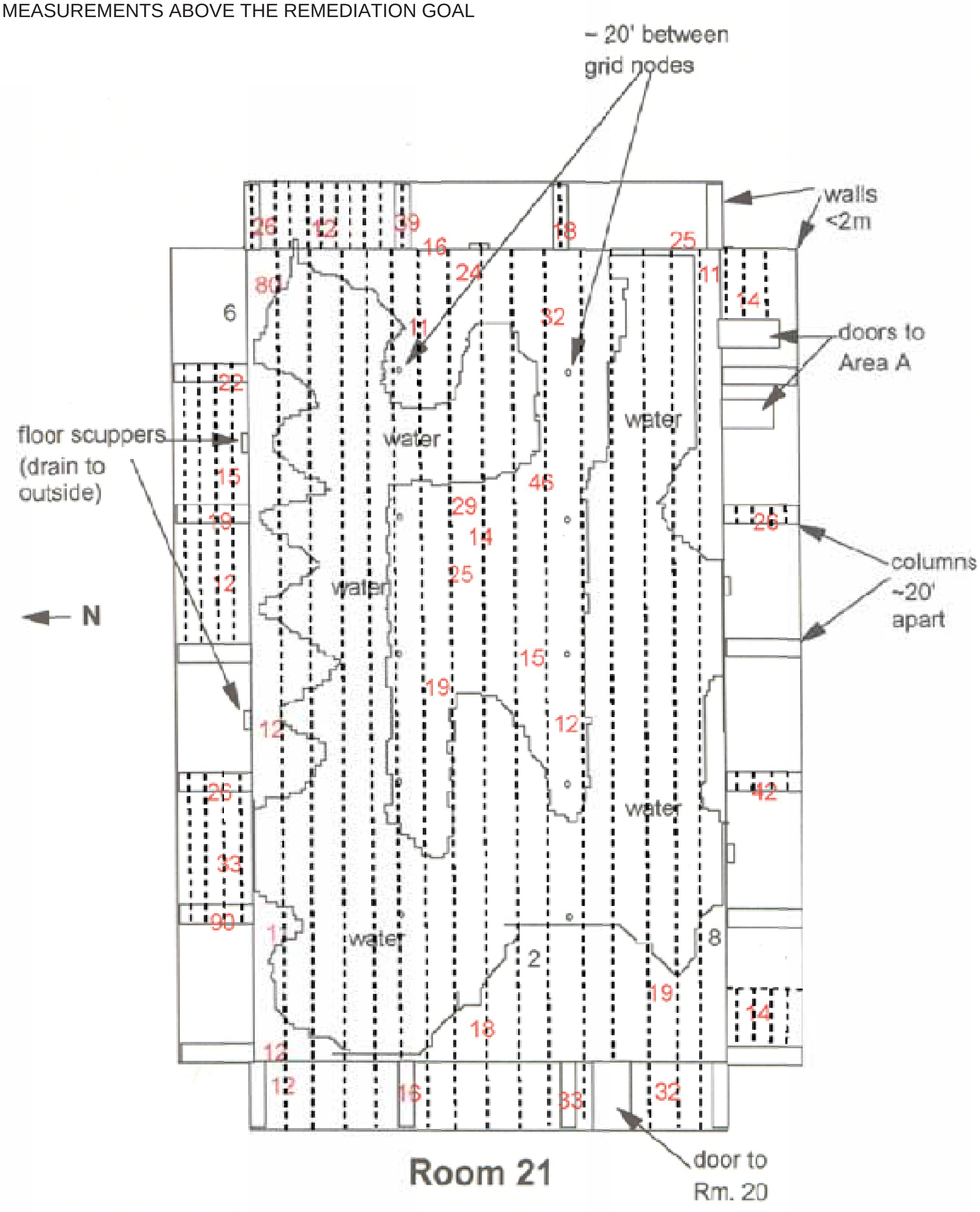
APPROXIMATE LOCATIONS WITH SURFACE ACTIVITY
MEASUREMENTS ABOVE THE REMEDIATION GOAL



Adapted from IEM RI Report (July 1998)

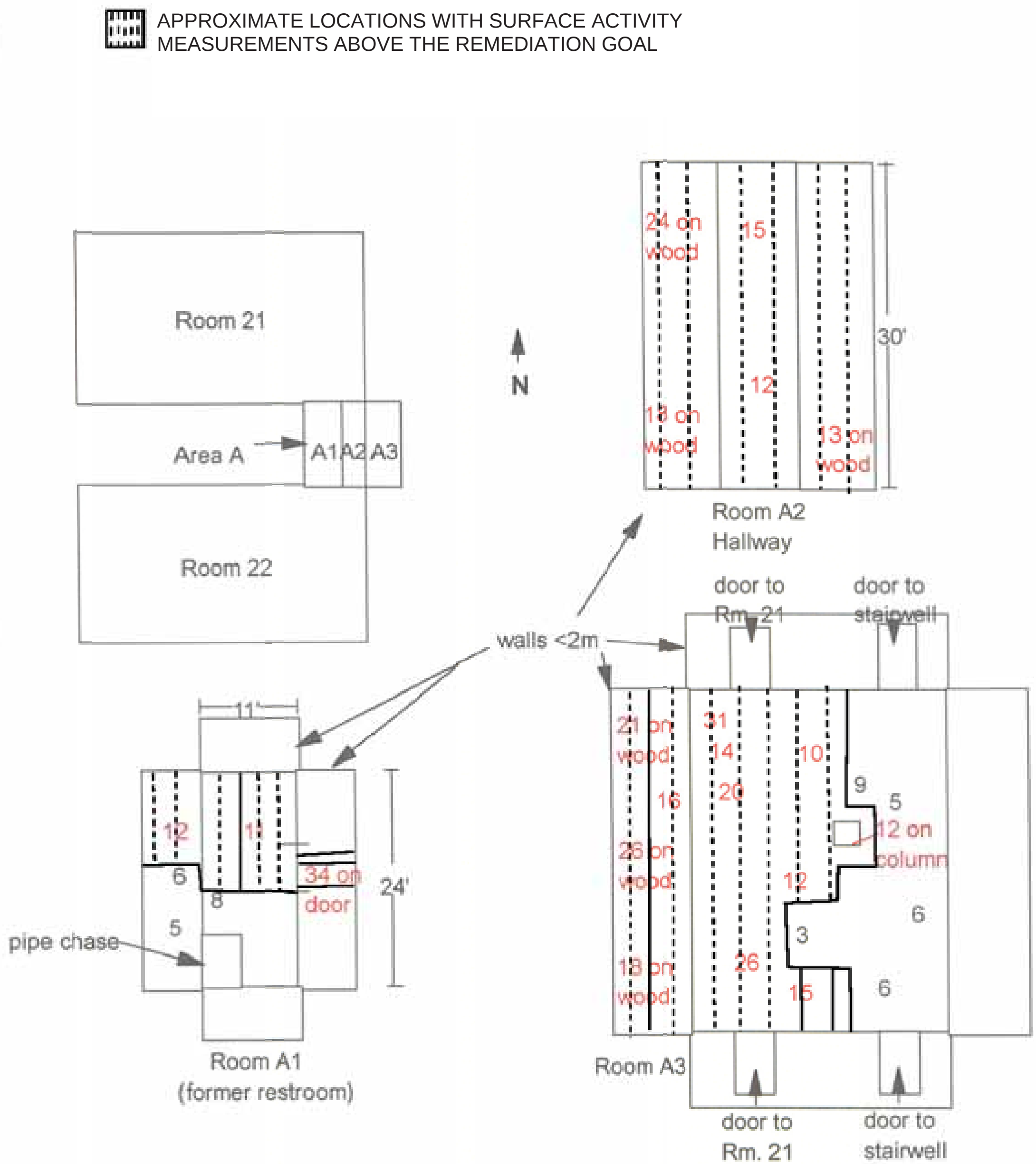
POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOM 17 **OU2: ARMSTRONG BUILDING** **WELSBACH/GGM CONTAMINATION SUPERFUND SITE**	**FIGURE 9**

APPROXIMATE LOCATIONS WITH SURFACE ACTIVITY MEASUREMENTS ABOVE THE REMEDIATION GOAL



Adapted from IEM RI Report (July 1998)

POTENTIAL LOCATIONS REQUIRING REMEDIATION - ROOM 21 OU2: ARMSTRONG BUILDING WELSBACH/GGM CONTAMINATION SUPERFUND SITE	FIGURE 10



Area A, Rooms A1, A2, and A3 (connector rooms between Rooms 21 and 22)

Adapted from IEM RI Report (July 1998)

POTENTIAL LOCATIONS REQUIRING REMEDIATION - AREA A
OU2: ARMSTRONG BUILDING
WELSBACH/GGM CONTAMINATION SUPERFUND SITE

FIGURE 11

APPENDIX III

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Welsbach and General Gas Mantle Contamination Superfund Site
Operable Unit 2 – Armstrong Building

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for Operable Unit 2 (OU2) of the Welsbach and General Gas Mantle Contamination Superfund Site (Welsbach Site), and the U.S. Environmental Protection Agency's (EPA's) responses to those comments. OU2 relates to radiological contamination within the Armstrong Building at the Welsbach Site. At the time of the public comment period, EPA proposed decontamination of the radiological contamination within the Armstrong Building, along with disposal of the decontamination wastes at an off-site licensed facility, as the remedy for OU2. All comments summarized in this document have been considered in EPA's final decision for selecting the remedy for the Armstrong Building at the Welsbach Site.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community involvement and interest regarding the Welsbach Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS, AND RESPONSES: This section contains summaries of oral comments received by EPA at the public meeting, EPA's responses to these comments, as well as responses to written comments received during the public comment period.

III. ATTACHMENTS: The last section of this Responsiveness Summary provides attachments which document public participation in the remedy-selection process for this Site. The attachments are as follows:

Attachment A: the Proposed Plan that was distributed to the public for review and comment;

Attachment B: the public notices that appeared in the *Courier-Post* and the *Gloucester City News*;

Attachment C: the transcript of the public meeting; and

Attachment D: the written comments received by EPA during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

As with many Superfund sites, the contamination at the Welsbach Site is complex. In order to manage the cleanup of the Welsbach Site more effectively, EPA has organized the work into four phases or operable units (OUs): OU1, soils and waste materials; OU2, the Armstrong Building; OU3, surface water, sediments, and wetlands; and OU4, groundwater.

In January 1999, EPA made available for public comment the Proposed Plan and supporting documentation for OU1, soils and waste materials at the Site. In July 1999, EPA signed a Record of Decision (ROD) selecting a remedy for OU1, which included demolition of the General Gas Mantle Building and the excavation and off-site disposal of the radiologically contaminated soils at the Welsbach Site.

In May 2005, EPA released the Proposed Plan and supporting documentation to the public for comment for the surface water, sediment, and wetlands in the Welsbach Site study area (OU3). In September 2005, EPA signed a ROD for OU3 that indicated that no remedial action was necessary for the surface water, sediment, and wetlands.

On July 21, 2011, EPA released the Proposed Plan and supporting documentation to the public for comment for the Preferred Remedy for OU2 at the Welsbach Site, the Armstrong Building. EPA made these documents available to the public in the administrative record repositories maintained at the EPA Region 2 office (290 Broadway, New York, New York 10007-1866), the City of Camden Ferry Avenue Branch Library (852 Ferry Avenue, Camden, NJ 08104); the Heart of Camden Offices (1840 Broadway, Camden, NJ 08104); and the Gloucester City Public Library (Monmouth and Hudson Streets, Gloucester City, NJ 08030). Notices of availability for the documents in the administrative record were published in the *Courier-Post* on July 20, 2011 and in the *Gloucester City News* on July 21, 2011. The public comment period was held from July 21, 2011 through August 22, 2011. On August 3, 2011, EPA held a public meeting to present the Preferred Remedy for OU2 at the Gloucester City Courthouse, City Hall, 313 Monmouth Street, Gloucester City, NJ, 08030.

EPA will address potential groundwater contamination (OU4) at the completion of the OU1 remedy.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS, AND RESPONSES

PART 1: Verbal Comments

This section summarizes comments received from the public during the public comment period, and EPA's responses. EPA held a public meeting on August 3, 2011, at 7:00 p.m. at the Gloucester City Courthouse, City Hall, 313 Monmouth Street, Gloucester City, NJ.

August 3, 2011 Public Meeting

Comments and questions raised by the public following EPA's presentation are categorized by relevant topics and presented as follows:

- Remedial Action
- Human Health Risk
- General Community Concerns

Remedial Action

Question 1: How long will the remedial action take to complete?

EPA Response: EPA estimates that the cleanup will take approximately one year to complete.

Question 2: Does the cost of $3.5 million for the decontamination remedial alternative cover repair of the roof and walls of the Armstrong Building?

EPA Response: The $3.5 million cost estimate only covers EPA proposed cleanup activities and does not include any work outside the scope of EPA's activities. Repairs to the roof and walls are outside the scope of EPA's activities.

Question 3: Once EPA issues a letter of no further action on the Armstrong Building, will there be any specific caveats for use of the building and will any supplemental monitoring be required?

EPA Response: Statutory reviews (*e.g.*, Five-Year Reviews) will not be required since the remedy will permanently remove the radioactive contamination from building surfaces. EPA will conduct Final Status Surveys (FSS) once the cleanup is complete to confirm that the remediation was successful. The FSS process will alleviate the need to conduct radiological monitoring in the future. Upon completion of the remedial action, EPA will release the building for unrestricted use with respect to Welsbach-related radiological contamination.

Human Health Risk

Question 4: What would be the risk to nearby residents and/or first responders in the event of a fire at the Armstrong Building?

EPA Response: One of the scenarios evaluated in EPA's Risk Assessment was the release of radiological contamination from the Armstrong Building due to a catastrophic event, such as a fire or building collapse. The risks from such a scenario were below EPA's acceptable risk range. In addition, the rooms where radiological contamination has been identified are constructed of concrete and masonry and do not have flammable items stored in them. Therefore, a fire in these rooms is unlikely.

Question 5: Are there any instructions for first responders (*e.g.*, fire fighters, EMTs, police) responding to an emergency at the Armstrong Building?

EPA Response: EPA will meet with the local first responders to go over any radiological issues with respect to an emergency situation.

Question 6: What is the risk to police chasing trespassers through the Armstrong Building?

EPA Response: The short-term risks are not significant since the gamma exposure rates are low and the majority of the contamination in the building is not removable (fixed within the building materials). This means that even if someone were to come into contact with the contaminated building surfaces, the radiological contamination would not spread to the person. More importantly, it is extremely unlikely that a trespasser would be able to access the Armstrong Building since it is located on a privately secured property that is monitored 24 hours a day.

General Community Concerns

Question 7: What will the building be used for once EPA's cleanup is complete and does the building go back to the property owner at that time?

EPA Response: After the cleanup is complete, EPA will issue a letter to the property owner notifying them that the radiological cleanup of the Armstrong Building is complete. There will be no restrictions for its future use. The property owner can do what it wants with the building in accordance with State and local requirements.

Question 8: Is the contamination contained? Does EPA anticipate that the extent of contamination could expand?

EPA Response: EPA believes that the radiological contamination in the Armstrong Building is well defined since the contamination is on the surface of the building materials and the contaminated areas can be accurately located and identified with field instruments. Therefore, EPA anticipates that the extent of contamination should not significantly increase under current uses.

Question 9: As part of the Remedial Investigation (RI), did EPA also collect soil and groundwater samples, and if so, was any radiological contamination found?

EPA Response: In 1999, EPA signed a ROD for OU1at the Welsbach Site, and selected a remedy that included excavation and off-site disposal of the radiologically contaminated soils. The OU1 soil cleanup is currently underway. EPA plans to address the groundwater at the Welsbach Site in the future, after the OU1 soil cleanup activities are complete.

Question 10: Does the ROD for OU1 cover the location of the Armstrong Building?

EPA Response: The Armstrong Building and the contamination within the building are being addressed under OU2 at the Welsbach Site. The OU1 remedy addresses all of the contaminated soil associated with the Welsbach Site, including the contaminated soils on the port facility where the Armstrong Building is located.

Question 11: Since the Armstrong Building is in poor physical condition, has EPA identified any contamination that has migrated outside the building through damaged areas, cracks, crevices, etc?

EPA Response: EPA has not found any radiological contamination outside the Armstrong Building that could have come from contamination migrating from the contaminated building surfaces inside the Armstrong Building. Based on historical information (*e.g.*, the Welsbach facility did not operate on this side of Essex Street until after the Armstrong Building was constructed), it is unlikely that radiologically contaminated soil is present under the building. However, EPA has not collected soil samples beneath the building. EPA plans to collect subsurface soil samples beneath the Armstrong Building as part of the OU1 remedial design activities. If soil contamination is found beneath the Armstrong Building, it will be addressed as part of the OU1 remedy.

Question 12: Since floodplains in the Camden and Gloucester City areas are changing, are the soil and groundwater investigations that EPA conducted previously still relevant, or is additional sampling required?

EPA Response: EPA is continuing to evaluate all areas where radiologically contaminated soils may be present throughout the study areas. To date, EPA has cleaned up a majority of the properties in the floodplain. Additional groundwater sampling will be conducted after OU1 remedial activities are completed.

PART 2: Written Comments

Comments and concerns that were not addressed at the public meeting were accepted in writing during the public comment period. Copies of these comments are included in Appendix D of this Responsiveness Summary. A summary of each written comment received is included below along with EPA's response.

<u>Comments Received from Manko, Gold, Katcher, and Fox, LLP, on behalf of GMT Realty, LLC, on August 22, 2011</u>

Comment 1: The Proposed Plan appears to contain a typographical error in that it states that this Preliminary Remediation Goal (PRG) is for OU3 instead of OU2.

EPA Response: The Proposed Plan does contain a typographical error. The PRG of 500 dpm/100 cm^2 is applicable to OU2, not OU3. This has been corrected in the OU2 ROD.

Comment 2: EPA should confirm that NJDEP will accept this PRG as satisfying its dose-based radiological release criteria of 15 millirem per year total effective dose equivalent.

EPA Response: NJDEP has notified EPA that the PRG identified in the Proposed Plan is acceptable.

Comment 3: EPA should clarify its statement of page 9 of the Proposed Plan that the PRG has been selected "for both fixed and removable contamination." It is unclear how EPA evaluated the percentage of risk from contamination that is fixed versus removable, and NJDEP should confirm that EPA's evaluation of risk from fixed and removable contamination is acceptable for purposes of satisfying its dose-based release criteria.

EPA Response: As summarized in the 2011 Supplementary RI, very limited removable contamination was identified in the Armstrong Building. Integrated Environmental Management, Inc. (IEM) collected more than 60 wipe samples from piping, window ledges, floors, and the roof, and only one sample was identified by IEM as having elevated removable levels. This was a wipe sample collected from the floor in Room 17 with an activity of 362 dpm/100 cm^2. During the ARCADIS/Malcolm Pirnie supplementary RI, 15 wipe samples were collected from overhead piping and heating, ventilation, and air conditioning components and no removable contamination was detected in any of these samples. As a conservative measure, 10% removable contamination was assumed in the risk assessment to calculate the PRG. It is likely that the percentage of removable contamination actually present is much less than 10%. During the remedial design of the Armstrong Building, EPA will collect additional wipe samples to verify that the removable contamination assumptions used to develop the Remediation Goal (RG) are valid. Furthermore, NJDEP has reviewed EPA's risk evaluations for both fixed and removable contamination and found them to be acceptable.

Comment 4: In performing the baseline risk assessment ("BRA") for the Building, EPA noted that the upper bound of the acceptable cancer risk for radionuclides is 1 in 10,000 per the National Contingency Plan ("NCP"). However, EPA appears to have misapplied the acceptable risk standard for various hazards evaluated in the BRA, stating that 2 and 3 in 10,000 was "near the upper bound of the risk range" when it is actually a risk that is 2 or 3 times greater than the acceptable upper bound, respectively.

EPA Response: The Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30, April 22, 1991 provides background on conducting site-specific baseline risk assessments under the NCP. This directive, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*", specifically states "*EPA uses the general 10(-4) to 10(-6) risk range as a "target range" within which the Agency strives to manage risks as part of a Superfund cleanup."* The document further indicates that *"Furthermore, the upper boundary of the risk range is not a discrete line at 1 x 10(-4), although EPA generally uses 1 x 10(-4) in making risk management decisions. A specific risk estimate around 10(-4) may be considered acceptable if justified based on site-specific conditions, including any remaining uncertainties on the nature and extent of contamination and associated risks. Therefore, in certain cases EPA may consider risk estimates slightly greater than 1 x 10(-4) to be protective."* Since the nature and extent of contamination within the Armstrong Building, along with the associated risk, is adequately characterized, EPA determined that a risk estimate slightly greater than 1×10^{-4} is protective for the Armstrong Building.

Comment 5: After EPA finishes the decontamination of the Armstrong Building, can future demolition and related disposal activities occur without any restrictions relating to residual radiologic constituents remaining in or under the Building?

EPA Response: Decontamination of the contaminated building surfaces will permanently remove all radioactive contamination that is present above the remediation goals. EPA will conduct an FSS once the cleanup is complete to confirm that the remediation was successful. The FSS process will alleviate the need to conduct radiological monitoring in the future. Upon completion of the remedial action, EPA will release the building for unrestricted use with respect to Welsbach-related radiological contamination.

Please note, other hazardous substances, such as asbestos-containing materials and lead paint, are present in the Armstrong Building, and EPA cannot make any assurances the building can be demolished using normal means and methods without any additional health and safety requirements because of this contamination. In addition, EPA cannot make any assurances that the resulting demolition debris can be managed as ordinary construction debris. As stated above, EPA will release the building for unrestricted use with respect to Welsbach-related radiological contamination. EPA is not responsible for the remediation of any non-Welsbach related contamination.

With respect to potential contamination being present beneath the Armstrong Building, as previously discussed, it is unlikely that radiologically contaminated soil is present. However, EPA plans to collect soil samples beneath the Armstrong Building as part of the OU1 remedial design activities to evaluate the soils. If soil contamination is found beneath the Armstrong Building, it will be addressed as part of the OU1 remedy.

Comment 6: In order to ensure that costs associated with the radiologic contamination (*sic*) are not improperly left for GMT, EPA must confirm that there will be no federal licensing requirements or analogous State licensing requirements for the Building, or any demolition debris generated there from, relating to the radiological contamination following the decontamination proposed in the Proposed Plan. It is unclear from the Proposed Plan whether a radiological license has or will be issued relating to the contamination in the Building or at the Site.

EPA Response: The radiological contamination in the Armstrong Building is considered to be the result of "ore processing residuals generated prior to 1978 (pre-1978 11(e)2)". The NRC has notified EPA that the NRC has no regulatory authority over this material until it is received by a NRC licensee (*i.e.*, disposal facility). Therefore, no licenses should be needed for the handling and disposal of any waste from the building.

In addition, since EPA is conducting the remediation under CERCLA, there are no licensing requirements under either 10 CFR 20 or N.J.A.C. § 7:28 for Welsbach-related radiological contamination associated with the Armstrong Building. Furthermore, since EPA will be removing all the radiological contamination above remediation goals, licensing requirements, if applicable, would be moot. After decontamination, the annual dose from residual radioactivity will meet unrestricted release of 15 mrem/year, which is below the NRC unrestricted-release limit for the general public of 25 mrem/year.

Comment 7: The Proposed Plan indicates the FSSs will only be conducted in the remediated rooms and not for the entire Building. EPA should retain responsibility for conducting additional investigative and remedial activities (including FSSs) if additional areas of radiological contamination are identified in or under the Building in the future.

EPA Response: Prior to the start of the OU2 remedial action, EPA will evaluate the entire building using Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) methodologies as a guide. This study could include a historical site assessment, and as warranted, field investigations. Areas found to have radioactive contamination above the RG during the MARRSSIM analyses would be included in the remedial design as requiring cleanup. FSSs will only be conducted in the rooms in which cleanup are performed. At the completion of the remedial action, EPA will use the data from both the MARRSSIM analyses and the FSSs to determine if the remedial action is complete and that the Armstrong Building can be released with no Welsbach-related restrictions regarding its future use.

Since EPA will remove all radiological contamination above the RG in the Armstrong Building, there will be no need to conduct additional investigations or remedial activities at the Armstrong Building in the future. If soil contamination is found beneath the Armstrong Building, it will be addressed as part of the OU1 remedy.

Comment 8: The Proposed Plan states that EPA will investigate and remediate areas previously deemed inaccessible as part of the remedial design for decontamination, but it is unclear in the Proposed Plan how EPA will gain access to certain of these areas. In addition, it remains unclear how EPA will investigate and remediate several areas that were previously deemed structurally unsafe, including the elevator shaft, stairways, and connectors. Is EPA proposing to temporarily shore these areas? EPA should consider demolition to access and permanently address these areas instead. Moreover, without complete or partial demolition of the Building, certain areas (including underneath the Building and in Room 11 where contamination on the floor was detected deeper beneath the surface) will remain inaccessible. Thus, the decision to only decontaminate the portions of the Building with identified contamination could result in leaving unidentified contamination in or under the Building. EPA should consider the partial demolition of certain portions of the Building.

EPA Response: EPA disagrees that demolition or partial demolition is necessary to access potential contamination in the inaccessible and unsafe areas. EPA believes these areas can be adequately characterized using MARSSIM methodologies. As previously discussed, prior to conducting any remedial activities at the Armstrong Building, EPA plans on conducting a design investigation, including a historical site assessment. According to Chapter 3 of MARSSIM, a historical site assessment can be used to make various recommendations including:

- "*The site or area is impacted and further investigation is needed before a decision regarding final disposition can be made. The area may be Class 1, Class 2, or Class 3, and a scoping survey or a characterization survey should be performed.*"

- "*The site or area is non-impacted. There is no possibility or an extremely low probability of residual radioactive materials being present at the site. The site or area can be released.*"

If the historical site assessment concludes that an investigation is necessary, EPA believes many areas deemed inaccessible by IEM, such as wall areas covered with insulation or portions of the building with poured concrete over the original floor, are likely accessible through various means such as the following:

- A drill rig can be used to bore through the poured concrete floor to access and investigate the original floor.

- Wall and floor coverings can be removed, as was done during the ARCADIS/Malcolm Pirnie RI, to access the wall/floor areas.

- Field instruments that measure beta and/or gamma radiation, rather than alpha radiation can be used. IEM used field instruments that measure alpha radiation during its RI; alpha particles will only travel a few centimeters in air and are blocked by dirt, paint, and other interferences on the surfaces being investigated. Beta and gamma particles are faster and travel farther than alpha particles and are stopped by solid materials.

Additional areas investigated that are found to have radioactive contamination above the RG would be included in the remedial design for remediation. All design investigations and remedial action activities would be conducted with appropriate health and safety methods.

Furthermore, EPA identified the deepest surface contamination in Room 11, at a depth just over 1 inch, which is easily accessible via current decontamination technologies. A typical decontamination procedure would involve physical removal or chemical decontamination of a thin lens of material and radiological scanning of the newly exposed/remediated face to determine if the RG has been met. This procedure would be repeated until the RG is attained. Therefore, EPA believes that the Selected Remedy (Decontamination) will be able to remove all radioactive contamination above the remedial goal for the Armstrong Building for significantly less money than demolition (or partial demolition) of the building.

If soil contamination is found beneath the Armstrong Building it will be addressed as part of the OU1 remedy.

Comment 9: The Proposed Plan states that decontamination and demolition would provide a similar level of protection to human health and the environment and that both alternatives offer long-term effectiveness. However, given the potential for future releases of residual unidentified contamination associated with the decontamination alternative, either complete or partial demolition would be more protective and would offer more long-term effectiveness.

EPA Response: EPA disagrees that the demolition alternative would be more protective and would offer more long-term protectiveness. Decontamination will remove all radiological contamination that is present above the RG. This will allow for the unrestricted use of the Armstrong Building. Therefore, both decontamination and demolition offer similar long-term effectiveness regarding protection of human health and the environment.

Comment 10: EPA does not appear to have addressed the risks to workers implementing the different remedial alternatives. The risk to remediation works could be substantially lower for demolition than decontamination given the comparatively limited exposure the demolition workers would have to the radioactivity, structural, and other environmental hazards in the Building.

EPA Response: EPA disagrees with this assessment for the following reasons.

- The estimated amounts of radiologically contaminated waste that would be generated for Alternatives 2 and 3 are 90 cubic yards (cy) and 3,900 cy, respectively. The volume estimated for Alternative 3 is larger than Alternative 2 because of potential cross contamination during demolition activities. Therefore, a demolition worker could be exposed to larger volumes of radiologically contaminated materials than a decontamination worker.

- Demolition requires radiological screening activities to segregate radioactive and non-radioactive waste streams; Alternative 2 does not. Therefore, a demolition worker could be exposed to larger volumes of radiologically contaminated materials than a decontamination worker.

- Other environmental hazards, such as ACM and lead, are present in the Armstrong Building. To the extent these contaminant are associated with the radiological cleanup, EPA will address these contaminants. However, EPA will not address materials unassociated with the radiological cleanup. The decontamination remedy would result in minimal worker contact with these other hazardous materials; only limited abatement would be needed in the areas where the hazardous substance is co-located with radiologically contaminated building materials. For a demolition remedy, abatement/removal of other hazardous substances would be required for the entire building. Therefore, a demolition worker could be exposed to larger volumes of other hazardous materials than a decontamination worker.

- While the Armstrong Building is in poor physical condition (*i.e.*, portions of the outside wall and roof are missing), the building appears to be structurally sound. A structural survey will be conducted before any remedial activities can occur.

Comment 11: The Proposed Plan indicates that decontamination is readily implementable while demolition would pose significant access and staging issues. GMT is confident that any access and staging issues can be resolved and would not present an impediment to implementing an alternative involving complete or partial demolition of the Building.

EPA Response: While EPA appreciates GMTs willingness to work through access and staging issues, demolition would require a significant amount of area on the port facility for various uses including, but not limited to, temporary haul roads, ingress/egress routes, decontamination facilities, and waste storage and processing areas. Given the limited open space near the Armstrong Building, and since the building is located near the entrance to the facility, and due to the significant amount of truck traffic on the property, EPA believes decontamination is more readily implementable than demolition since decontamination will occur inside the non-occupied portions of the Armstrong Building.

Comment 12: EPA did not evaluate the true range of potential alternatives to allow a remedy to be properly selected in accordance with the NCP. In preparing the Proposed Plan, EPA only performed a detailed screening of three alternatives; no action, decontamination of the Building, and demolition of the entire Building. In contrast, the Feasibility Study (FS) prepared in 2000 for GMT evaluated six additional alternatives (surface sealing, two options involving limited decontamination and then complete demolition, and three options involving partial demolition and limited decontamination). More than ten years has transpired since GMT's Feasibility Study was issued, and the condition of the Building has deteriorated to the point that the majority of it no longer can be reused once decontaminated. Accordingly, the delay in addressing the radioactive contamination in the Building has significantly impacted GMT's future options for the Building.) Because, as the Proposed Plan acknowledges, the radiological contamination appears to be primarily confined to certain areas of the Building, alternatives involving demolition of these areas should have been evaluated by EPA.

EPA Response: EPA disagrees that it did not evaluate the "true range" of alternatives in the FS and that the delay in selected a remedy has affected the condition of the building. EPA believes that it has correctly followed the remedy-selection guidance in 40 CFR 300, §300.430(e)(9)(iii).

Furthermore, as stated in 40 CFR 300.430(e)(i), Subpart E – Hazardous Substance Response, of the NCP "*The number and type of alternatives to be analyzed shall be determined at each site, taking into account the scope, characteristics, and complexity of the site problem that is being addressed.*" This indicates that the number of alternatives to be evaluated for a site is not prescriptive but is based on a variety of site-specific factors.

As shown on Table B-1 of the 2011 FS, EPA calculated that partial demolition of the Armstrong Building would result in approximately 14,000 cy of material and complete demolition would result in approximately 19,000 cy of material; a difference of about 25%. Based on this evaluation, along with the inherent difficulties in conducting partial demolition of portions of the three-story building, EPA determined that partial demolition and complete demolition were so similar that carrying both alternatives forward in the FS was not necessary. Therefore, only complete demolition was evaluated in the 2011 FS. EPA also did not consider a combination of decontamination and demolition since decontamination, by itself, would meet the remedial action objectives and would satisfy the threshold and primary balancing criteria identified in the NCP.

While GMT considers that the Armstrong Building has deteriorated to the point that the majority of the building cannot be reused once decontamination is complete, the condition of the Armstrong Building would have only become a factor in EPA's selection of alternatives if the building had been found to be structurally unsound such that decontamination could not safely take place. Although the Armstrong Building is in poor physical condition, the building appears to be structurally sound.

Comment 13: EPA should confirm that its cost estimate for demolition is correct. The 2000 Feasibility Study prepared by GMT calculated a total cost for demolition of approximately $5.3M assuming that all of the waste generated (calculated to be 17,600 CY) could be sent to a landfill. Even assuming that all of the waste generated by demolishing the building would need to go to Envirocare in Utah, the total cost of demolition was estimated to be approximately $52M.

EPA Response: The cost estimate in the FS is a conservative value developed in accordance with guidance contained in OSWER 9355.0-75, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, July 2000, which indicates that FS costs should be conservative values that take into account contingencies for a variety of unforeseen circumstances and/or unanticipated conditions that could not be evaluated from the data available at the time the estimate was prepared. OSWER 9355.0-75 also stipulates that the expected accuracy of the FS cost estimate is -30% to +50%.

Furthermore, the $5.3M cost referenced by GMT is associated with IEM's Alternative 3b; IEM's alternative included partial decontamination along with demolition. As previously discussed, EPA did not consider a combination of decontamination and demolition since decontamination by itself meets the remedial action objectives for the Armstrong Building and satisfies the threshold and primary balancing criteria in the NCP.

EPA's cost for the demolition alternative included a precise and controlled demolition technique in place of conventional demolition procedure to prevent the spread of radiological contamination to the environment (*e.g.*, through creation of radiologically contaminated dust) and to minimize cross contamination of adjacent, non-contaminated building materials. Therefore, this demolition technique is very time-consuming and expensive.

Comment 14: EPA should evaluate at least two options involving partial demolition of the Building. Specifically, EPA should evaluate demolishing most of the areas of the Building with levels of radioactive contamination and should also evaluate performing this partial demolition after decontaminating the areas to be demolished. The areas of the Building with acceptable levels of radioactivity could then be left for unrestricted future demolition, renovation, renovation or future re-use.

GMT proposes that EPA evaluate an option in which some of the sub-buildings are retained, with only some rooms requiring decontamination. This partial demolition would also permanently address almost all of the areas previously identified as inaccessible.

EPA Response: EPA disagrees that additional remedial alternatives should have been considered. As previously discussed, in the FS, EPA screened out a number of alternatives, including partial demolition, and EPA evaluated only the remedial alternatives that were deemed practicable based on a variety of site-specific factors. EPA used the following factors in FS screening process to develop the remedial alternatives:

- Only a very limited amount of contamination has been identified in the building (*i.e.*, less than 0.5% of the total building; approximately 90 cy of radiologically contaminated material. The entire volume of the building is estimated at 19,500 cy).

- EPA believes the areas deemed inaccessible by IEM are accessible through either a historical site assessment, as described in MARSSIM, or field investigations during the remedial design.

- EPA determined that a combination of decontamination and demolition (partial or complete) is not practical since decontamination alone satisfies the remedial action objectives for the building. Therefore, any demolition of the building would need to use a controlled technique to avoid the spread of radiological contamination in the building to the environment (*e.g.*, generation of radiologically contaminated dust).

- Although portions of the Armstrong Building are in poor physical condition, the building itself is structurally sound.

- Limited technologies are available to address radiological contamination.

EPA believes that it has correctly followed the remedy-selection guidance in 40 CFR 300, §300.430(e)(9)(iii). After evaluating the remedial alternatives deemed practicable, EPA determined that demolition, (whether partial or complete), is not as effective as decontamination at meeting the nine evaluation criteria required by the NCP.

As described above, EPA does not believe that demolition is needed to access areas identified as inaccessible by IEM. It is unlikely that unidentified radiological contamination associated with the Welsbach Site would remain in the Armstrong Building after the Selected Remedy is implemented.

Comment Received from the Public

Comment 1: An email was received from a resident hoping that the effort to clean up the area will be successful and that environmental concerns continue to be realized in the future.

EPA Response: As previously discussed, EPA is continuing the cleanup efforts associated with the Welsbach Site and believes the cleanup will be successful.

PART 3: Written Comment Received After Public Comment Period Closed

EPA received an anonymous letter dated August 30, 2011, after the August 22, 2011 date the public comment period closed. Although EPA is not required to consider this letter as part of the public comment period, EPA believes it is appropriate to respond to this letter in this Responsiveness Summary.

Comment 1: A worker at the port property was concerned about the elevated radiation levels in the parking lot adjacent to the Armstrong Building.

EPA Response: EPA is aware that there are elevated gamma radiation levels in this area of the parking lot. However, this contamination is shielded by the asphalt surface and EPA and property owner monitor the area to make sure that the radiologically contaminated soils below the surface do not become exposed. These elevated levels do not pose any unacceptable risks to workers on the port property, or to any of the products that come into the port.

ATTACHMENT A

PROPOSED PLAN

Superfund Program
Proposed Plan

U.S. Environmental Protection Agency,
Region 2

Welsbach/General Gas Mantle Contamination Superfund Site

July 2011

DATES TO REMEMBER:
MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 21 - August 22, 2011

EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: August 3, 2011

EPA will hold a public meeting to explain the Proposed Plan. EPA will also accept oral and written comments at the meeting. The meeting will be held at 7:00 p.m.at the

Gloucester City Courthouse at City Hall
313 Monmouth Street
Gloucester City, New Jersey

For more information, see the Administrative Record at the following locations:

U.S. EPA Records Center, Region 2
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212) 637-3261
Hours: Monday-Friday - 9 am to 5 pm

Camden Library- Ferry Avenue Branch
852 Ferry Avenue
Camden, NJ 08104
(856) 757-7640
Hours: Monday - Friday: 9 am – 5 pm

Gloucester City Public Library
Monmouth and Hudson Streets
Gloucester City, NJ 08030
(856) 456-4181
Hours: Monday – 12 pm to 9 pm
Tuesday and Friday – 9 am to 5 pm
Wednesday and Thursday – 9 am to 9 pm
Saturday – 10 am to 1 pm

Heart of Camden
1840 Broadway
Camden, New Jersey 08104
(856) 966-1212
Hours: By appointment

EPA ANNOUNCES PROPOSED PLAN

The United States Environmental Protection Agency (EPA) is issuing this Proposed Remedial Action Plan (Proposed Plan) to present EPA's Preferred Alternative (Preferred Alternative) for Operable Unit Two (OU2, Armstrong Building) of the Welsbach/General Gas Mantle Contamination Superfund Site (Site) in Camden and Gloucester City, New Jersey (NJ).

The Preferred Alternative described in this Proposed Plan is to decontaminate contaminated building surfaces in the Armstrong Building and dispose of the decontamination waste at a permitted off-site facility. EPA will also conduct appropriate environmental testing to ensure the effectiveness of the cleanup.

This Proposed Plan summarizes information from the July 2011 Remedial Investigation and Feasibility Study (RI/FS) report for OU2. EPA is the lead agency for the Site and the New Jersey Department of Environmental Protection (NJDEP) is the support agency.

This Proposed Plan is being issued as part of EPA's public participation requirements under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) 42 U.S.C. § 9617(a), commonly known as Superfund, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The public's comments will be considered and discussed in the Responsiveness Summary of the Record of Decision (ROD), which will document EPA's selected remedy. This Proposed Plan summarizes information that can be found in greater detail in the RI/FS report for OU2. The RI/FS and other supporting documents for this Proposed Plan are contained in the Administrative Record File for the Site, which is available at the locations listed above. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Superfund activities that have been conducted at the Site.

WELSBACH/GENERAL GAS MANTLE CONTAMINATION SUPERFUND SITE STUDY AREAS

Study Area 1 - includes the former GGM facility and residential and commercial properties that surround the GGM facility.

Study Area 2 - includes the location of the former Welsbach facility and nearby residential/commercial properties. The Armstrong Building is located on the former Welsbach facility.

Study Area 3 - includes residential and recreational properties in Gloucester City.

Study Area 4 - includes residential properties in the Fairview section of Camden.

Study Area 5 - includes residential properties, vacant land, and two municipal parks near Temple Avenue and the South Branch of Newton Creek in Gloucester City.

Study Area 6 - includes residential and commercial properties, as well as vacant land, near Market, Powell, and Seventh Streets, in Gloucester City.

SITE HISTORY

Between the 1890s and 1940s, the Welsbach Company (Welsbach) manufactured gas mantles at its facility in Gloucester City, NJ. Beginning around 1895, Welsbach imported monazite ore to use as its source of the radioactive element thorium. Welsbach extracted thorium from the ore and used it in its gas mantle manufacturing process since thorium caused the mantles to glow more brightly when heated. Just after the turn of the 20th century, Welsbach was the largest producer of gas mantles and lamps in the United States, making up to 250,000 mantles per day. It appears that around 1915, Welsbach moved its operations from the property along the southwestern corner of Ellis and Essex Streets to the newly built Armstrong Building and other buildings on the north side of Essex Street. Welsbach went out of business in 1940.

A second gas mantle manufacturing company, General Gas Mantle (GGM), located in Camden, NJ, was a small competitor to Welsbach. GGM operated from 1912 to 1941. While there is little information on its activities, it appears that GGM only used refined thorium in its gas mantle manufacturing processes.

During the years Welsbach was in operation, ore tailings and other wastes were used as fill throughout Gloucester City. Over the past 100 years, a number of Welsbach buildings were demolished and the building debris may also have been used as fill in the Gloucester City area.

The Site was initially identified by EPA as part of its investigation at the U.S. Radium Corporation Superfund Site in Orange, NJ. Records from U.S. Radium indicated they had purchased radium from Welsbach. In 1981, as a result of this information, EPA sponsored an aerial radiological survey of the Camden and Gloucester City area to investigate the possible presence of radioactive contamination. Based on an evaluation of these data, EPA identified six study areas for the Site.

In 1996, EPA placed this Site on the National Priorities List, and in1997, EPA contracted Malcolm Pirnie, Inc. to perform an RI/FS for the Site. The RI/FS was finalized in January 1999. In July 1999, EPA issued a ROD for the first of four operable units (OU1). The selected remedy for OU1 included excavation and off-site disposal of radiologically contaminated soil and waste materials from the former Welsbach and GGM facilities and the nearby residential and commercial properties. The remedy also included decontamination and demolition of the GGM building.

In 2002, EPA conducted ecological investigations and developed human health and ecological Risk Assessments (RAs) for the surface water, sediments and wetland areas along the South Branch of Newton Creek, Martin's Lake, and the Delaware River (OU3). In July 2005, EPA issued a ROD for OU3, which indicated that no remedial action was necessary for surface water, sediments, and wetlands at the Site.

This Proposed Plan for OU2 addresses radioactive contamination in the Armstrong Building, the last remaining building from Welsbach's operations. A fourth operable unit is planned to investigate potential groundwater contamination associated with the Site.

OU1 - REMEDIAL ACTIONS IMPLEMENTED TO DATE

To date, EPA has removed and disposed of more than 200,000 cubic yards of radiologically contaminated soil and waste material from the Site as part of OU1 cleanup activities. These activities include:

Camden

- Demolition of the former GGM building and the adjacent Dynamic Blending building.
- Excavation and disposal of radiologically contaminated soils on the following properties:
    - The former GGM facility and nearby properties.
    - About 40 residential properties.
    - A property on Jasper Street that is the site of a community theater.

Gloucester City

- Excavation and disposal of radiologically contaminated soils on the following properties:
    - Gloucester City Swim Club and the adjacent residential properties along Essex Street.
    - The Gloucester City Land Preserve and North Ball Fields along Johnson Boulevard.
    - About 40 other residential properties including those between Highland Boulevard and Klemm Avenue, and Temple Avenue adjacent to Newton Creek.
    - A property on Sixth Street, between Division and Hunter Streets that is the proposed site of a new middle school.

OU2 SITE CHARACTERISTICS

Armstrong Building Site History

The Armstrong Building is a three-story building located at Ellis and Essex Streets, in Gloucester City. The property the Armstrong Building is located on includes an active port, warehouse, and logistics facility, currently owned by GMT Realty Limited Liability Company (LLC). The port facility is operated by Gloucester Marine Terminal, LLC through Holt Logistics.

The Armstrong Building consists of six connected buildings containing approximately 200,000 square feet of floor space. It has three basement areas and three above-ground stories, and is constructed of masonry and reinforced concrete.

From around 1915 to 1940, the Armstrong Building was one of the buildings used in the manufacturing of gas mantles. Welsbach extracted the radioactive elements thorium and radium from monazite sand; thorium was used to manufacture gas mantles, while the radium was sold to other parties for use in luminescent paint.

In 1942, the U.S. Government acquired the Welsbach Facility and sold it to the Randall Corporation in 1948. Randall leased the property to the Radio Corporation of America, Victor Division. A series of intervening owners followed. In 1976, Holt Cargo Systems (Holt Cargo) purchased the former Welsbach property and used the Armstrong Building for offices, warehousing operations, and storage.

Contaminants of Concern

The primary radionuclides of concern at the Armstrong Building, Thorium-232 (Th-232) and Radium-226 (Ra-226), are from the thorium and radium series decay chains. With half-lives of 14 billion years and over 1,600 years, respectively, both Th-232 and Ra-226 are extremely long-lived. Therefore, radioactive decay does not contribute significantly toward their degradation in the environment.

Site Conditions

The entire port facility is privately secured. The closest residential property is approximately 400 feet east of the Armstrong Building. The Walt Whitman Bridge is located immediately to the north and the Delaware River is located approximately 1,000 feet to the west.

At present, the Armstrong Building is in poor physical condition. Many of the exterior walls on the 2nd and 3rd floors of the building, as well as the 3rd floor ceiling, are open to the environment. Due to the condition of the building, only a few rooms on the 1st and 2nd floors are currently being used by Holt Logistics for offices, warehousing operations, and storage with a small portion of the 2nd floor of the building used for offices and training.

Enforcement History

In May 1997, Holt Cargo, the former owner of the Armstrong Building property, voluntarily entered into an Administrative Order on Consent (AOC) with EPA to conduct a radiological investigation of the building. In accordance with the terms of the AOC, Holt Cargo agreed to conduct an RI/FS for the Armstrong Building. Holt Cargo contracted with Integrated Environmental Management, Inc. (IEM) to conduct this investigation. Under the AOC, Holt Cargo submitted the following reports to EPA:

- *Remedial Investigation Report for the Armstrong Building*, July 1998
- *Comparative Analysis of Remedial Alternatives*, May 1999
- *Baseline Risk Assessment for the Armstrong Building*, January 2000
- *Feasibility Study for the Armstrong Building*, January 2000 (IEM, 2000b)

OU2 INVESTIGATIONS

NJDEP

In 1991, the NJDEP conducted an investigation at the Armstrong Building consisting of surface exposure rate and working level measurements. During this investigation, elevated surface exposure rate readings (exposure rates not specified) were found on the 2nd and 3rd floors. In addition, elevated working level measurements were found on the 2nd floor in Room 9 and on the 3rd floor in Rooms 15, 16, 17, 19, and 20. No elevated readings were found on the 1st floor.

IEM RI

In 1998, IEM, on behalf of Holt Cargo, conducted an RI at the Armstrong Building. Prior to conducting any field work, IEM divided the building into affected and unaffected areas based on the 1991 NJDEP investigation. Affected areas were those areas where radioactive materials were likely to have been used, handled, or stored and/or areas identified by NJDEP as potentially contaminated.

IEM conducted the following surveys during the RI:

- Floor Scans - A floor monitor, calibrated to respond to alpha radiation, was used to scan potentially affected floor surfaces.
- Walls Scans - Where practicable, a similar approach was used for the walls. In affected areas, all wall surfaces were scanned from the floor to a height of approximately six feet (the approximate height of an adult). In addition, approximately ten percent of the wall areas higher than six feet were scanned; these areas were randomly selected.
- Alpha Radiation Measurements - At floor or wall surfaces where the scanning measurements found residual alpha radiation activity above the project criterion, more definitive measurements were collected to confirm and quantify the level of alpha radiation.
- Horizontal Surface Samples/Alpha Radiation Measurements - For horizontal surfaces (*i.e.*, floors, pipes) with elevated readings, a sample

was collected to determine the level of removable activity (*i.e.*, capable of spreading). A second alpha radiation measurement was collected at this location to determine the amount of contamination that is fixed in place (*i.e.*, cannot spread without disturbance).

- Building Materials Sampling - 109 samples of building materials (*e.g.*, concrete, brick) were collected and sent to an off-site laboratory for analysis.

IEM did not investigate some areas of the Armstrong Building due to non-radiological health and safety concerns or accessibility issues. These included the following:

- The access to the elevator shaft and stairway on all three floors located between Rooms 16 and 27 (deemed structurally unsafe).
- A "connector" between Room 16 and either Room 21 or 22 (deemed structurally unsafe).
- Exterior walls underneath drains (inaccessible).
- Portions of the basement (filled with debris).
- 1st floor warehouse (areas with poured concrete over the original floor).
- Painted areas on walls and columns and areas under floor tiles (IEM conducted alpha scans; alpha scans are ineffective on covered surfaces).
- A below-grade pipe chase (inaccessible).
- Inaccessible wall areas in four rooms (Rooms 11, 12, 14, and 20) that were covered by insulation and other materials.
- The roof, including exhaust vents and the ceiling in Rooms 21 and 22.

A copy of IEM's RI Report is included in the Administrative Record for the Site.

<u>ARCADIS/Malcolm Pirnie RI</u>

In 2010, ARCADIS/Malcolm Pirnie, under a contract with the U.S. Army Corps of Engineers, conducted a supplementary RI at the Armstrong Building to fill some potential data gaps in IEM's RI/FS. The focus of the ARCADIS/Malcolm Pirnie supplementary RI was on the building material surfaces in the rooms on the 2nd and 3rd floors of the Armstrong Building since the NJDEP and IEM did not find any Welsbach-related radioactive contamination on the 1st floor.

The purpose of the supplementary RI was to:

- Confirm the radiological measurements and data collected by IEM during its investigation.
- Collect a limited amount of additional data, to close some data gaps identified in IEM's investigation.
- Determine if IEM's data meet the current data quality objectives of the project and if so, use these data, together with the new data collected by ARCADIS/Malcolm Pirnie to develop a new Baseline RA.
- Reevaluate the technologies and alternatives for remediating radioactive contamination, and associated costs, presented by IEM in its FS.

Surveys conducted during the supplementary RI consisted of the following:

- Beta and/or gamma radiation scans in limited areas (*i.e.*, at select locations or along transects on the floors and along transects, mainly up to a height of six feet, along the walls and columns).
- The collection of samples to determine if contamination is removable.
- Building materials sampling.
- Radon (Radon-222)/thoron (Radon-220) sampling.

Overall, the Supplementary RI results correlated well with IEM's RI results. The ARCADIS/

Malcolm Pirnie Supplementary RI is included in the Administrative Record for the Site.

IEM and ARCADIS/Malcolm Pirnie RI Summary

Both the IEM and ARCADIS/Malcolm Pirnie RIs identified radioactive contamination in four rooms on the 2nd floor (Rooms 9, 10, 11, and 13) and eight rooms on the 3rd floor (Rooms 15, 16, 17, 18, 19, 20, 21, and 22). Radioactive contamination was also found in one stairway.

The following additional information was obtained during the RIs:

- With the exception of Room 11, volumetric building sample results indicate that radioactive contamination is predominantly due to thorium series radionuclides. The radioactive contamination in Room 11 appears to be associated with Ra-226.
- With one exception, the volumetric building material sample results indicate that contamination of building materials is superficial (*i.e.*, contained within the top 1/8 inch of the surface). One volumetric floor sample from Room 11, collected to a depth of 1-1/8 inch, had an elevated Ra-226 concentration.
- Building material contamination varied by room and location within a room and locations within a room were not uniformly contaminated.
- Removable contamination was found on the floors in Rooms 11, 13, 17, and 20.
- Removable contamination was not detected on any of the top horizontal surfaces of the pipes and heating, ventilation, and air conditioning components sampled.
- Radon was detected below 2 picocuries per liter (pCi/L) and thoron was not detected in any of the rooms tested (EPA's action level for radon is 4 pCi/L).

It should be noted that the radiological contamination detected in the Armstrong Building does not meet the criteria of a "principal threat waste", as defined by the NCP.

SCOPE AND ROLE OF ACTION

As with many Superfund sites, the Welsbach Site is complex and has been divided into separate phases of OUs:

OU1 – Addresses the radiologically contaminated soils and waste materials at the former Welsbach and GGM facilities, and other properties in the Camden and Gloucester City area.

OU2 – Addresses the radiological contamination in the Armstrong Building, the last remaining building from Welsbach's gas mantle operations.

OU3 – Evaluated the potential radiological contamination in the surface water, sediment, and wetland areas around the Site.

OU4 – Will evaluate the potential impacts to the groundwater from the radiological contamination at the Site.

The response action described in this Proposed Plan is for OU2. This Proposed Plan summarizes the remedial alternatives detailed in the FS and discusses the Preferred Alternative for addressing radiological contamination on building surfaces and building materials in the Armstrong Building.

SUMMARY OF SITE RISKS

EPA used radiological data from both IEM's RI and the ARCADIS/Malcolm Pirnie supplementary RI to conduct a new Baseline RA since IEM's Baseline RA was more than ten years old and there have been significant updates and improvements in computer modeling that evaluates risk. The new Baseline RA included additional exposure scenarios and human receptors that were identified based on the current owner's plans to demolish the Armstrong Building in the future.

EPA identified three primary risk pathways to human health associated with the Armstrong Building: 1) threat of release of radioactive material from the 2nd and 3rd floors of the building; 2) threat to human health in the event the building is reused without decontamination; and 3) threat to human health in the event the building is demolished and disposed of without decontamination.

Threat of Release of Radioactive Material

The majority of the Armstrong Building is no longer used, with Gloucester Marine Terminals and Holt Logistics using a portion of the 1st floor for offices, warehousing operations, and storage, along with a small portion of the 2nd floor for offices and training. The property owner plans to demolish the building at a future date.

The building, which is over 90 years old, is in poor physical condition with many of the exterior walls on the 2nd and 3rd floors, along with the 3rd floor ceiling, open to the environment. Several rooms on the 3rd floor where the ceiling has collapsed or where the roof is leaking have extensive water damage, and moss and some plants are growing in the water-damaged areas. In addition, wildlife (*e.g.*, rodents, feral cats, pigeons) lives on portions of the 2nd and 3rd floor. Due to these factors, the deterioration of the building is expected to continue. As this deterioration continues over time, it is expected that the threat of a release of radioactive contamination to the environment will increase through various release mechanisms, such as fire and/or building collapse.

Threat to Human Health

In 2011, ARCADIS/Malcolm Pirnie developed a Baseline RA for the Armstrong Building that evaluated the current and future risks posed to humans by exposure to Th-232 and Ra-226, along with their decay products, in the Armstrong Building. EPA classifies all radionuclides as known human cancer causing agents (Group A carcinogens); therefore, cancer risk associated with their radiotoxicity is the primary concern and incremental cancer risk from exposure to radioactive contamination, along with their decay products, is the only health effect of concern at the Armstrong Building. Additionally, non-cancer toxicity values are not available for the radionuclides of concern; therefore, non-cancer

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at a site in various media (*e.g.*, soil, building materials, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a “one in ten thousand excess cancer risk”; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a “hazard index” (HI) is calculated. The key concept for a non-cancer HI is that a “threshold” (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the ROD.

hazards were qualitatively evaluated in the Baseline RA.

Risk Assessment

According to EPA, cleanups of radionuclides are governed by the risk range for all carcinogens established in the NCP, when applicable or when relevant and appropriate requirements are not available or are not sufficiently protective. For known or suspected carcinogens, the NCP established that acceptable exposure levels are generally concentration levels that represent an incremental upper-bound lifetime cancer risk in the range from 10^{-4} (*i.e.,* 1×10^{-4} or 1 in 10,000) to 10^{-6} (*i.e.,* 1×10^{-6} or 1 in 1,000,000) or less.

Potential receptors and exposure pathways identified for the Armstrong Building Baseline RA were based on current and future land use, the physical condition of the building, and the radioactive contamination identified. The exposure routes were evaluated as appropriate for the potential receptors. The following populations and scenarios were evaluated in the Baseline RA.

<u>Catastrophic release/general public exposure scenario</u> – Due to the deteriorated condition of the Armstrong Building, a catastrophic release is possible through several mechanisms including fire or building collapse. The population evaluated included the general public in the vicinity of, and downwind of the building, with a potential exposure pathway of inhalation.

Based on this evaluation, an incremental lifetime cancer risk of 2 in 10,000 (2×10^{-4}), which is near the upper bound of the acceptable cancer risk range, was calculated for a receptor on the adjacent Walt Whitman Bridge.

<u>Building demolition exposure scenarios</u> – This scenario was modeled since the current owner plans to demolish the building at a future date. Potential receptors include demolition workers inside the building and hypothetical residents living in a residence built above buried debris from the demolished building. Potential exposure pathways evaluated include external exposure, inhalation via radon/thoron or airborne dust, and ingestion.

The incremental lifetime cancer risks for these scenarios are as follows:

- Demolition worker – an incremental lifetime cancer risk of 2 in 100,000 (2×10^{-5}) was calculated, which is within the cancer risk range.

- Hypothetical Resident – risks ranged from 2 in 10,000 (2×10^{-4}) for an adult, which is near the upper bound of the risk range, to 3 in 100,000 (3×10^{-5}) for a child, which is within the cancer risk range.

<u>Building reuse/occupational and residential exposure scenarios</u> – This assessment evaluated the potential for exposure to both indoor workers and residents under the assumption that the building is renovated in the future for either commercial/industrial or residential use. This scenario was evaluated since the radionuclides of concern, Th-232 and Ra-226, do not degrade significantly in the environment over time. Therefore, it is expected that radioactive contamination will be present in the Armstrong Building for well beyond the foreseeable future. Potential exposure pathways evaluated include external exposure, inhalation via radon/thoron or airborne dust, and ingestion.

The incremental lifetime cancer risks for the building reuse exposure scenarios are as follows:

- Future Indoor Workers –
  - For all rooms except Room11, risks ranged from 4 in 100,000 (4×10^{-5}), which is within the risk range, to 9 in 10,000,000 (9×10^{-7}), which is below the risk range.

  - For Room 11, a risk of 5 in 10,000 (5×10^{-4}) was calculated, which is greater than the risk range.

- Future Resident Adult –
  - For Room 11, a risk of 3 in 1,000 (3×10^{-3}) was calculated, which is greater than the risk range.

- For Room 17, a risk of 6 in 10,000 (6×10^{-4}) was calculated, which is greater than the risk range.

- For the following rooms, all risks were near the upper bound of the risk range:

  - Room 9 (3 in 10,000 or 3×10^{-4}).
  - Room 10 (3 in 10,000 or 3×10^{-4}).
  - Room 13 (2 in 10,000 or 2×10^{-4}).
  - Room 15 (2 in 10,000 or 2×10^{-4}).
  - Room 21 (3 in 10,000 or 3×10^{-4}).
  - Area A (2 in 10,000 or 2×10^{-4}).

- For all other rooms and areas, risks ranged from 1 in 10,000 (1×10^{-4}) to 8 in 100,000 (8×10^{-5}), which is within the risk range.

- Future Resident Child –
  - For Room 11, a risk of 6 in 10,000 6×10^{-4}), which is greater than the risk range, was calculated.
  - For all other rooms and areas, risks ranged from 1 in 10,000 (1×10^{-4}) to 8 in 1,000,000 (8×10^{-6}), which is within the risk range.

Based on the results of the RA, the following radionuclides of concern were identified in the Armstrong Building:

- Th-232 in Rooms 9, 10, 13, 15, 17, 21, and Area A.

- Ra-226 in Room 11.

Actual or threatened releases of hazardous substances from this portion of the Site, if not addressed by the preferred alternative, or the other active measure considered, may present a current or potential threat to public health, welfare, or the environment.

REMEDIAL ACTION OBJECTIVES

To protect the public and the environment from potential current and future health risks, the following remedial action objectives were developed for the Armstrong Building:

- Prevent radiation exposure from radiological contamination on building surfaces.

- Prevent future release of radioactive contamination from the Armstrong Building to the environment.

To determine what areas of the Armstrong Building require remediation, risk-based Preliminary Remediation Goals (PRGs) were developed based on the results of the ARCADIS/Malcolm Pirnie Baseline RA. The following PRGs were derived for both Th-232 and Ra-226:

- **Th-232** - 500 disintegrations per minute per 100 square centimeters (dpm/100 cm^2)

- **Ra-226** - 1,000 dpm/100 cm^2

EPA has selected the more conservative Th-232 PRG of 500 dpm/100 cm^2, not including background, for both fixed and removable contamination as the Remediation Goal (RG) for OU3. This RG was selected since:

- The majority of the rooms are contaminated with Th-232.

- Alpha, beta, and gamma radiation scans, which are used to detect radiation on or within building surfaces, are not radionuclide-specific. Therefore, radionuclide-specific RGs cannot be used.

SUMMARY OF REMEDIAL ALTERNATIVES

For the Armstrong Building, general response actions that address potential future human exposure to radioactive materials include the following:

- No action, which is evaluated under CERCLA to provide a basis for comparison to the other alternatives

- Institutional controls (land use restrictions)

- Engineering controls (containment)

- Active Remediation - building decontamination and building demolition

Institutional controls are non-engineered instruments, such as administrative and legal controls (*e.g.*, land use zoning restrictions, environmental covenants) that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Engineered controls for surficial radioactive contamination include installation of an engineered physical barrier (*i.e.*, concrete shielding) to prevent contact and minimize exposure to the underlying contaminated material.

EPA considered the feasibility of institutional/engineered controls, along with long-term operation and maintenance (O&M) for the Armstrong Building. However, due to the long half-life of the radionuclides of concern, and since the NCP emphasizes that institutional controls are meant to supplement engineering controls and will rarely be the sole remedy at a site, the institutional/engineered control alternative was not considered practical and sufficiently protective. Therefore, this alternative was not evaluated further in the FS.

The alternatives evaluated in the FS are summarized below. A complete description of the evaluated alternatives is included in the FS, which is in the Administrative Record for the Site.

Alternative 1 – No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth: $0
Estimated Implementation Period: None

Under CERCLA, a "No Action" alternative is evaluated to provide a common basis on which to evaluate the other alternatives. In this alternative, the Armstrong Building would remain in its current condition without any provision for decontamination or engineering and institutional controls. Because the radiological contamination would remain in the building, EPA would be required to conduct reviews of the building every five years.

Since no action would be taken under this alternative, the physical condition of the building is expected to continually degrade over time, increasing the threat of a release of radioactive contamination to the environment via a catastrophic event (*e.g.*, fire, building collapse). If the building is demolished in the future, the radiologically contaminated demolition debris might inappropriately be used as fill. If residences are subsequently built above this fill, residents living above the buried building debris might be exposed to radioactive contamination. Furthermore, if the building were to be converted to residential use in the future, there could be unacceptable risks to human health.

This alternative would not reduce risk to human health to acceptable levels and would not achieve the remedial action objectives.

Alternative 2 – Complete Decontamination (Physical and/or Chemical), Off-Site Disposal

Estimated Capital Cost: $3,500,000
Estimated Annual O&M Cost: $0
Estimated Present Worth: $3,500,000
Estimated Implementation Period: One Year

Physical decontamination is the removal of surface radiological contamination by either surface cleaning or surface removal techniques while chemical decontamination is the removal of contamination through chemical reactions including acid or alkaline dissolution, redox reactions, and chelation. Locations in the Armstrong Building with radioactive levels above the RG would be decontaminated to the required extent using a combination of physical and chemical decontamination techniques.

A combination of different physical and chemical decontamination methods would be evaluated for contaminated building surfaces in the remedial design. Chemical decontamination may be utilized on building surfaces that are non-porous, and free of paint, tiles, and mastic. Chemical decontamination is not effective on porous, painted, or glazed surfaces, and may mobilize radiological or other contaminants when used for these media. Therefore, given the condition and construction of the buildings (brick and mortar walls from the turn of the last century, and painted surfaces on walls and concrete columns), chemical decontamination, if used, would only be effective on the concrete floors. Physical decontamination methods would be effective on the concrete floors, walls, and columns.

During the remedial design, EPA will also investigate the areas that IEM deemed inaccessible. EPA will remediate these areas if contamination is found. To demonstrate the effectiveness of the remedial action, EPA would conduct Final Status Surveys (FSS) in each remediated room. EPA would follow the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) as a guide to ensure that the remedial action objectives have been achieved. This will alleviate the need to conduct further radiological monitoring in the future.

Waste materials from the decontamination process would vary depending on the decontamination method(s) used. These wastes could include concrete, brick and mortar dusts, and mixtures, as well as spent media (*e.g.*, grit, sand, shot). Chemical decontamination wastes vary depending on the method(s) used but generally include liquid mixtures containing reagents and removed contaminants. Liquid chemical wastes typically require stabilization/solidification (*e.g.*, addition of Portland cement, lime, sand or other materials or chemicals) prior to transportation to satisfy disposal facility requirements. These wastes would be collected in drums and/or roll-off dumpsters, and sampled for radiological contaminants and landfill disposal parameters. Based on the analytical results, the waste would be segregated into Unimportant Quantities of Source Material (UQSM) or UQSM-Resource Conservation and Recovery Act (RCRA) waste, and shipped off-site to a licensed and permitted disposal facility.

Alternative 3 – Demolition, Off-Site Disposal
Estimated Capital Cost: $103,000,000
Estimated Annual O&M Cost: $0
Estimated Present Worth: $103,000,000
Estimated Implementation Period: Less than Two Years

Demolition is the complete removal of a building. It is a proven technology for the removal of radiological contamination from buildings and equipment. While a variety of demolition technologies are available, a selective, controlled technique would be required in order to prevent the spread of radiological contamination from the contaminated portions of the building to the environment during the demolition activities. For example, a typical demolition technique, implosion of the building, could generate radiologically contaminated dust. Therefore, this demolition alternative would include a precise and controlled demolition process. It should be noted that implementation of controlled demolition significantly increases cost due to additional time and labor to carefully demolish the building.

Demolition of radiologically contaminated buildings requires use of containment and monitoring measures to prevent migration of fugitive dust. Demolition includes preparing the demolished material for shipping and disposal, which may include segregation, size reduction, and screening of demolition rubble to reduce the volume of waste requiring disposal as UQSM. Given the condition and construction of the Armstrong Building (brick and mortar walls from the early 20th century) and painted surfaces on walls and concrete columns, comprehensive lead-based paint and asbestos surveys and structural/demolition assessment would be required to accurately estimate demolition material quantities, waste streams, and demolition methods for the remedial design and construction. Post-demolition activities would include filling open basements and re-grading the area.

Demolition wastes would include rubble (concrete, reinforced concrete, brick and mortar), structural steel, lumber and plywood, miscellaneous construction debris (e.g., Styrofoam), and heating, ventilation, and air conditioning equipment and ductwork. Based on their origin and known or suspected contamination, these wastes would be stockpiled in a waste storage and processing area or collected in roll-off dumpsters for screening and/or size reduction, and segregation, sampled for radiological contaminants and any analyses required by the landfill for disposal, and, based on the analytical results segregated into UQSM or UQSM-RCRA waste, and shipped off-site to a licensed and permitted disposal facility. Screening and size reduction equipment (e.g., shakers, screeners, hammer mills equipped with conveyors) would be required to segregate non-radiologically contaminated waste materials from the UQSM and UQSM-RCRA waste streams, if applicable.

EVALUATION OF ALTERNATIVES

In accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, remedial alternatives for the Armstrong Building were assessed against the nine evaluation criteria in 40 CFR 300, §300.430(e)(7)(iii). The alternative selected must first satisfy the threshold criteria set out in the NCP. Next, the primary balancing criteria are used to weigh the tradeoffs or advantages and disadvantages of each of the alternatives. The modifying criteria, which are State and community acceptance, are evaluated at the end of the public comment period. This section of the Proposed Plan summarizes the relative performance of each alternative against the criteria, noting how it compares with the other options under consideration. Additional information on the comparison of the remedial alternatives can be found in the ARACADIS/Malcolm Pirnie FS report.

1. Overall protectiveness of human health and the environment

Alternative 1 would not achieve this criterion since radioactive contamination associated with the Site would not be removed. Alternatives 2 and 3 would provide overall protection of human health and the environment on a similar basis or level.

As Alternative 1 is not protective of human health and the environment, it is eliminated from consideration under the remaining eight criteria.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Threshold Criteria

1. *Overall protectiveness of human health and the environment* – Evaluates whether an alternative provides adequate protection and how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with Applicable or Relevant and Appropriate Requirements* – Evaluates whether or not an alternative will meet all applicable or relevant and appropriate requirements of Federal and State environmental statutes and/or justifies a waiver.

Primary Balancing Criteria

3. *Long-Term Effectiveness and Permanence* – Addresses the ability of an alternative to afford long-term, effective, and permanent protection to human health and the environment over time.

4. *Reduction of Toxicity, Mobility, or Volume through Treatment* – Address the extent to which an alternative will reduce toxicity, mobility, or volume of the contaminants causing the site risks.

5. *Short-Term Effectiveness* – Considers the length of time until protection is achieved and the short-term risk or impact to the community, on-site workers, and the environment that may be posed during the construction and implementation of the alternative.

6. *Implementability* – Considers the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement that remedy.

7. *Cost* – Includes estimated capital, O&M, and net present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria

8. *State Acceptance* – Address whether the State concurs with, opposes, or has no comment on the Preferred Alternative.

9. *Community Acceptance* – Considers whether the public agrees with EPA's analyses of the Preferred Alternative described in the Proposed Plan.

2. Compliance with ARARs

Actions taken at any Superfund site must meet all ARARs of federal and state law or provide grounds for invoking a waiver of these requirements. These include chemical-specific, location-specific, and action-specific ARARs. There are no chemical or radiological specific ARARs for the contaminated building materials. However, EPA developed risk-based cleanup standards using 10 CFR 300, which establishes acceptable remediation standards to protect human health. Alternatives 2 and 3 would comply with ARARs.

3. Long-Term Effectiveness and Permanence

Alternatives 2 and 3 offer long-term protection of human health and the environment as both remedial actions would be permanent, and all contaminated building materials would be removed from the Site for disposal in an off-site controlled, licensed facility.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

There would be no reduction of toxicity, mobility, or volume through treatment for Alternatives 2 and 3. No treatment technology presently exists that will reduce the toxicity, mobility or volume of radium and thorium. However, Alternatives 2 and 3 would reduce the mobility of radiological contaminants by removal, off-site disposal, and management of these wastes at an approved landfill permitted to accept radiological waste.

5. Short-Term Effectiveness

Exposure to radiological contamination by construction workers and the public during implementation of Alternatives 2 and 3 is a potential concern. However, this exposure would be reduced by the use of: on-site engineering control measures for minimizing dust generation; restrictions on the size of area being worked; and other demolition best management practices that would minimize the exposure to particulate contaminants.

6. Implementability

From a technical standpoint, both Alternatives 2 and 3 are implementable as experienced firms, personnel, and equipment are readily available and both alternatives use readily available, proven technologies. From a logistical standpoint, Alternative 2 is readily implementable as only a limited area would be needed for access and staging requirements. Logistically, Alternative 3 would be more difficult to implement since the Armstrong Building is located on a very active port. The limited space for storing and handling of the demolition debris would pose significant access and staging issues for this alternative. Alternative 3 would also generate a significant volume of waste for disposal.

7. Cost

Alternative 3 (demolition) would be significantly more expensive to implement than Alternative 2 (decontamination). The estimated costs for Alternative 2 and 3 are $3,500,000 and $103,000,000, respectively.

8. State Acceptance

The State of New Jersey is currently evaluating EPA's Preferred Alternative in this Proposed Plan.

9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends, and will be described in the Responsiveness Summary contained in the OU2 ROD.

SUMMARY OF PREFERRED ALTERNATIVE

The Preferred Alternative discussed in this Proposed Plan addresses radiological contamination in the Armstrong Building. EPA's Preferred Alternative for OU2 is Alternative 2, which includes the following:

- Decontamination (physical and/or chemical) of radiologically contaminated building surfaces and building materials in the Armstrong Building.
- Transportation of radiologically contaminated wastes generated during the remedial action to an approved off-site facility.

The estimated cost for the Preferred Alternative is $3,500,000.

EPA is issuing this Proposed Plan to solicit public comment on the Preferred Alternative for the

Armstrong Building (OU2). EPA will select a remedy for OU2 only after the public comment period has ended and the comments received during the comment period have been reviewed and considered. As stated earlier, the public's comments will be considered and discussed in the Responsiveness Summary of the ROD, which will document EPA's selected remedy.

Based on new information and/or comments received on the Preferred Alternative, the final selected OU2 remedy may be different from the Preferred Alternative presented in this Proposed Plan.

COMMUNITY PARTICIPATION

EPA and NJDEP provide information regarding the cleanup of the Welsbach/General Gas Mantle Contamination Superfund Site to the public through public meetings, the Administrative Record file for the Site, and announcements published in the local newspaper. EPA and the State encourage the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

To ensure the community's concerns are being addressed, a public comment period lasting 30 calendar days will open July 21, 2011 and close on August 22, 2011. During this time, the public is encouraged to submit comments to EPA on the Proposed Plan.

The date, location, and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan.

For further information on the Welsbach/General Gas Mantle Contamination Superfund Site, please contact:

Rick Robinson
Remedial Project Manager
(212) 637-4371
Robinson.Rick@epa.gov

Natalie Loney
Community Involvement Coordinator
(212) 637-3639
Loney.Natalie@epa.gov

U.S. EPA
290 Broadway, 19th Floor
New York, New York 10007-1866

ARMSTRONG BUILDING & SITE STUDY AREAS WELSBACH/GGM SUPERFUND SITE CAMDEN COUNTY, NEW JERSEY	Figure 1

500086

ARMSTRONG BUILDING LOCATION
WELSBACH/GGM SUPERFUND SITE
CAMDEN COUNTY, NEW JERSEY

Figure 2

ATTACHMENT B

PUBLIC NOTICES

House deficit vote eclipses senators' accord

By DAVID ESPO
Associated Press

WASHINGTON

Defying a veto threat, the Republican-controlled House voted Tuesday night to slice federal spending by $6 trillion and require a constitutional balanced budget amendment to be sent to the states in exchange for averting a threatened Aug. 2 government default.

The 234-190 vote marked the power of deeply conservative first-term Republicans, and it stood in contrast to rising support at the White House and in the Senate for a late stab at bipartisanship to solve the nation's looming debt crisis.

President Barack Obama and a startling number of Republican senators lauded a deficit-reduction plan put forward earlier in the day that would include $1 trillion in what sponsors delicately called "additional revenue" and some critics swiftly labeled as higher taxes.

The president said he hoped congressional leaders would "start talking turkey" on a deal to reduce deficits and raise the $14.3 trillion debt limit as soon as Wednesday, using the plan by the so-called Senate Gang of Six as a road map.

Wall Street cheered the news of possible compromise as well. The Dow Jones industrials average soared 202 points, the biggest one-day leap this year.

Treasury officials say that without an increase in U.S. borrowing authority by Aug. 2, the government will not be able to pay all its bills, and default could result with severe consequences for the economy.

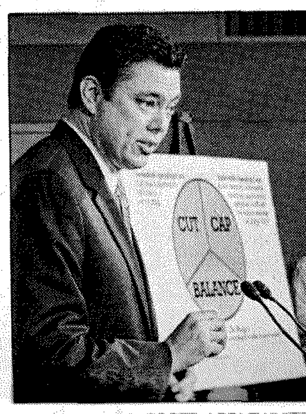
But a few hours after Obama spoke at the White House, supporters of the newly passed House measure breathed defiance.

"Let me be clear. This is the compromise. This is the best plan out there," said Rep. Jim Jordan, R-Ohio, head of a conservative group inside the House known as the Republican Study Committee.

The legislation, dubbed "Cut, Cap and Balance" by supporters, would make an estimated $111 billion in immediate reductions and ensure that overall spending declined in the future in relation to the overall size of the economy.

It also would require both houses of Congress to approve a balanced budget amendment to the Constitution and send it to the states for ratification.

With a dwindling amount of time remaining, the day's events did little to suggest a harmonious end was in sight to a clash between the parties.



J. SCOTT APPLEWHITE
Associated Press

House Budget Committee member Rep. Jason Chaffetz, R-Utah talks Wednesday about his 'Cut, Cap and Balance' plan proposed by Tea Party-backed House Republicans.

Senate Democrats have announced they will oppose the House passed-measure, although it could take two or three days to complete debate.

Debate in the House was along predictable lines, and only nine Republicans opposed the bill and five Democrats supported it on final passage.

"Our bloated and obese federal budget needs a healthy and balanced diet, one that trims the fat of overspending and grows the muscle of our nation's economy," said Rep. Reid Ribble of Wisconsin during debate on the measure.

Ribble is one of 87 first-term House Republicans determined to reduce the size of government.

Democrats said the measure, with its combination of cuts and spending limits, would inflict damage on millions who rely on Social Security, Medicare and other programs. "The Republicans are trying to repeal the second half of the 20th century," said Rep. Sander Levin, D-Michigan.

House Speaker John Boehner played a muted role in public during the day. He did not speak on the House floor on the bill.

The Gang of Six briefed other senators on the group's plan after a quest that drew disdain at times from the leaders of both parties and appeared near failure more than once.

It calls for deficit cuts of slightly less than $4 trillion over a decade and includes steps to slow the growth of Social Security payments, cut at least $500 billion from Medicare, Medicaid and other health programs and wring billions in savings from programs across the face of government.

It envisions tax changes that would reduce existing breaks for a number of popular items while reducing the top income bracket from the current 35 percent to 29 percent or less.

The tax overhaul "must be estimated to provide $1 trillion in additional revenue to meet plan targets," according to a summary that circulated in the Capitol.

Some Republicans noted a claim contained in the summary that congressional bookkeeping rules could consider the plan a tax cut of $1.5 trillion — a yardstick that credits sponsors for retaining income tax cuts enacted when George W. Bush was president.

The group of six includes three Democrats, Sens. Kent Conrad of North Dakota, Mark Warner of Virginia and Dick Durbin of Illinois, a member of the leadership.

The three Republicans, all conservatives, are Sens. Mike Crapo of Idaho, Tom Coburn of Oklahoma and Saxby Chambliss of Georgia, who has a particularly close relationship with Boehner dating to their days together in the House.

In recommending higher government revenues, Republicans in the group challenged party orthodoxy that has held sway for two decades, ever since President George H.W. Bush memorably broke his "no new taxes" pledge to make a deficit reduction deal with congressional Democrats.

BIKE USED IN MISCHIEF -- The Gloucester City Police Department is currently investigating an act of criminal mischief at the sewage pumping station next to the Gloucester High boys' varsity baseball field involving the bicycle above. The incident occurred before July 10 at 1:05 a.m., when utility personnel responded to a high water alarm in the pump well and discovered that the alarm was activated by someone cutting all of the wires for scrap. The individual entered the well by breaking off the lock and climbed down 20 feet into the pit to steal more wire. With the wires cut, the pumps failed to work and the well flooded, causing raw sewage to flood all of the equipment. The actor fled without the wire, which had a value of approximately $10. Police said this act of criminal mischief caused approximately $225,000 in damage to the station. If anyone recognizes the listed bicycle that was used by the actor, or if they saw anything in that area, please call the Gloucester City Detective unit at 856-456-7797.

PHOTO BY PATRICK HARKINS

STORM DAMAGE – A tree lies in a yard along River Drive, Westville, after being blown over during a bad storm July 7.

Attracting Butterflies

(Continued from page 1)

that live above or below the water, and the importance of protecting their home from pollution and trash.

Although not always visible, the pond supports five types of turtles, seven fish species, bull frogs, muskrats and various water birds, including a great egret and small blue heron.

Handouts will be provided to all participants. Bring a hat, sunscreen, perhaps binoculars, and a fishing pole.

Register in advance with Marie Callaghan, 856-456-7756 (email mcallaghan@snip.net), or Joyce Lovell at 856-456-2308 to receive a free activity book.

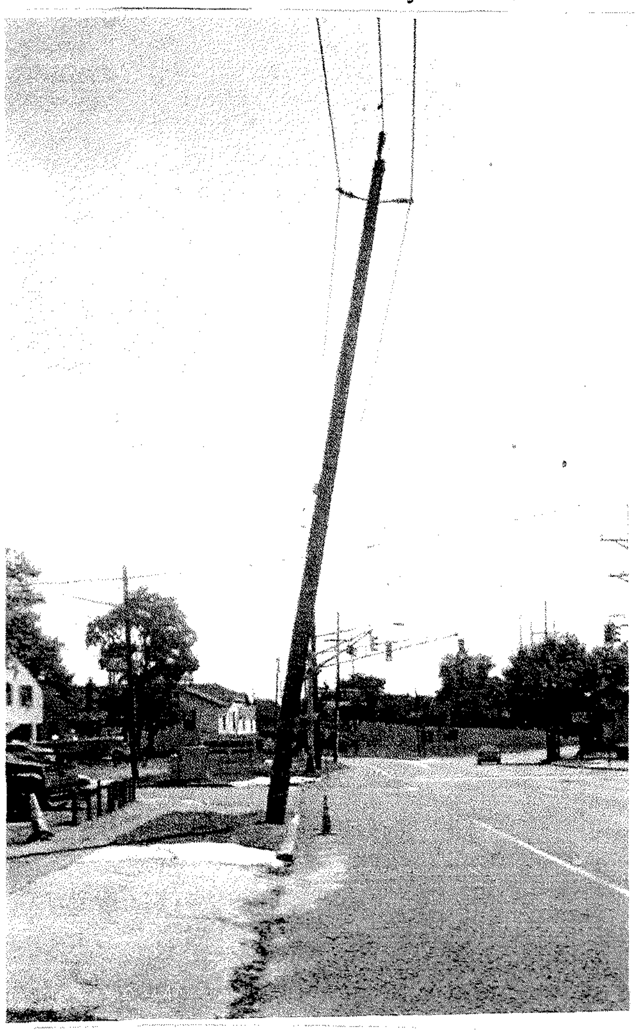


PHOTO BY SARA MARTINO

LEANING TELEPHONE POLE – This utility pole at Route 45 and Highland Avenue in Westville leans precariously over the road.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

EPA IS HOSTING A PUBLIC MEETING FOR THE WELSBACH/GENERAL GAS MANTLE SUPERFUND SITE

The U.S. Environmental Protection Agency invites you to attend a public meeting to discuss EPA's proposed remedy to address contamination at the Armstrong Building at the Welsbach/General Gas Mantle Superfund Site in Gloucester City, New Jersey. EPA's preferred remedy, which is described in the Proposed Plan, is to decontaminate contaminated building surfaces in the Armstrong Building and dispose of the decontamination waste at a permitted off-site facility.

The public meeting will be held at the:

Gloucester City Courthouse, City Hall
313 Monmouth Street
Gloucester City, NJ
On Wednesday, August 3, 2011
At 7:00 P.M.

Before selecting the final remedy, EPA will consider oral comments presented at the public meeting and written comments received during the thirty (30) day comment period. The comment period for the proposed plan runs from **July 21, 2011 to August 22, 2011.** Copies of the Proposed Plan and the Administrative Record for the Site are available at the following locations:

City of Camden Main Library
418 Federal Street
Camden, New Jersey 08103
(856) 757-7650

Gloucester City Public Library
Monmouth and Hudson Streets
Gloucester City, New Jersey 08030
(856) 456-4181

Heart of Camden
1840 Broadway
Camden, New Jersey 08104
(856)-966-1212

US EPA Records Center
290 Broadway, 18th floor
New York, New York 10007-1866
(212)-637-4308
By Appointment Only

Or you can access a copy of the proposed plan at:
http://www.epa.gov/region02/superfund/npl/welsbach/welsbach_prap.pdf

Written comments should be sent to: **Rick Robinson, Remedial Project Manager, U.S. EPA, 290 Broadway, 19th Floor, New York, NY 10007-1866 or via email to robinson.rick@epa.gov.**

If you have any questions regarding the public meeting you can call Ms. Natalie Loney, Community Involvement Coordinator at (212) 637-3639 or toll-free at 1-800-346-5009 or via email at loney.natalie@epa.gov.

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

In The Matter Of:

USEPA Proposed Plan Operable Unit 2 Armstrong Building, Welsbach/General Gas Mantle

PUBLIC MEETING

Vol. 1

August 3, 2011

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PUBLIC MEETING

U.S. ENVIRONMENTAL PROTECTION AGENCY PROPOSED PLAN
OPERABLE UNIT (OU)2: ARMSTRONG BUILDING
WELSBACH/GENERAL GAS MANTLE CONTAMINATION
SUPERFUND SITE

TRANSCRIPT of testimony as taken by and before Sean M. Fallon, a Certified Court Reporter and Notary Public of the State of New Jersey, at the Gloucester City Courthouse, City Hall, 313 Monmouth Street, Gloucester, New Jersey, on Wednesday, August 3, 2011, commencing at 7:04 o'clock in the evening.

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APPEARANCES:

U.S. ENVIRONMENTAL PROTECTION AGENCY

PAT SEPPI, Community Involvement Coordinator
RICK ROBINSON, Remedial Project Manager
MARIAN OLSEN, Risk Assessor
NIDAL AZZAM, Health Physicist

ARCADIS/Malcom Pirnie

LISA SZEGEDI, Principal Environmental Scientist

MEMBERS OF THE PUBLIC WITH COMMENTS:

John Hutchinson
William James
Dan Walker
Vince Barber
Howard Lambersky

MS. SEPPI: One of the things we wanted to mention is that what we do usually in these meetings, and I hope it works all right for this meeting, we have a short presentation, it's really not very long, and what we'd like is, if you could possibly hold your questions until the end of the presentation. What happens is a lot of times your questions get answered.

So, after our presentation, we'll certainly open up the floor so you can ask any of your questions about the clean-up of the Armstrong Building. If you do have any other questions about the Welsbach site in general, we can also take those questions after we're finished, but that won't be part of the official record.

You'll notice that we have a stenographer here tonight, Sean, and the reason he's here is because all your comments tonight will be part of our official record, so -- and then, you know, we will respond to your comments later on in the process.

So you -- and I'll remind everybody again, please, when ask your questions, if you could please give your name first so Sean will have that for the record. And don't worry; if you forget, I'm

sure he'll remind you.

So, again, the reason that we are here tonight is to talk about our clean-up of the Armstrong Building which is part of the Welsbach site.

My name is Pat Seppi, I'm a Community Involvement Coordinator with EPA in Region 2, and tonight we have a few other people with EPA. I'd like to ask them to introduce themselves and describe their relationship to the site.

MS. OLSEN: Hello. My name is Marian Olsen. I'm the Human Health Risk Assessor assigned to the site, and we will discuss the potential health effects, both currently and in the future, from exposure, and we'll talk about the results of that assessment in a few minutes.

MR. AZZAM: I'm Nidal Azzam, I'm health physicist for the project, and if you have any information issues, questions, I hope I can answer them.

MR. ROBINSON: And I'm Rick Robinson. I'm the project manager for EPA, and I'll be giving the presentation on the present issues.

MS. SEPPI: Okay.

So, we are very interested in hearing

your comments on our preferred alternatives for the site. This is one of the only times in the whole Superfund project where we actually have a public meeting and ask for your comments. Most of our meetings are a little bit more informal, you may have been to some, like public availability sessions and information sessions, but that's why Sean is here tonight, so we'll have a record of all your comments.

Once we receive that and issue our final document for this site, which is called the Record of Decision, it's a legally binding document, part of that document will be what's called a responsiveness summary, which is answers to your comments and to your questions for tonight.

So we have -- let me go to the agenda. I'm going to talk just very, very quickly about the Superfund process and then Rick is going to talk a little bit about the history and the background of the site, which I'm sure probably a lot of you know already. Then we'll talk about the investigations that were done, and Marian is going to talk a little bit about the risk assessment that we do, and then we'll go back to Rick and he'll explain the alternatives that EPA feels is best for

the site and talk about the next steps after that. After that we'll have a question session. If you would hold your questions, again, we would appreciate it.

If there are other documents -- there is lots of documents that are available to look at for this site, and we have three repositories, three of the local libraries, where we keep all these documents. We also have a website that you'll see on one of the slides that we have. That's a good place to go if you are looking for information, or if you want to see a copy of the Proposed Plan that we are talking about tonight, that's also on the website.

This is the Superfund process. So we're -- we start with an investigation of the site, which happened, you know, many years ago, when we put the site on the National Priorities List. That's a list of all the Superfund sites in the past identified in the country. Then we do what's called a Remedial Investigation, an RI, and then a Feasibility Study.

Now, that's what we just finished up here. The Feasibility Study is the alternatives that we are looking at to make a determination of

what the final remedy should be for the site. So where that arrow is right in between the RI/FS and the Record of Decision, again, which are legally binding documents.

After we have that Record of Decision, which will reflect the answers to your comments, we go into our actual design, you know, how we are going to clean up the site, our remedial action where we start doing the clean-up, and then we complete the construction. Eventually we delete the site from the National Priorities List and then we can talk about reuse of the site, as far as what's going to happen next.

So where we are right now is the RI/FS, Proposed Plan, Record of Decision stage. Remedial Investigation is all those many, many months of sampling that we do. We investigate the extent of the contamination, we try to delineate the contamination, we look at health risks, and then we look at different alternatives, you know, for clean-up of the site. And, again, that's what we've just finished up here.

The Proposed Plan, that's where we are tonight. This is where we want to take your public comments on the alternatives that we feel are

the best ones for the site. Again, the Record of Decision is a legally binding document, and then we'll have the remedial design and remedial action.

Most times remedial design takes anywhere from six, nine months to a year, probably -- I would think that that would probably be what would happen. So, hopefully, a year from the Record of Decision we would be ready to get out into the field and start the work on the site.

So I think I'll turn this over to Rick now and let him give you a little information about the history.

MR. ROBINSON: Thanks, Pat.

The Welsbach/General Gas Mantle site is located in the cities of both Camden and Gloucester City. We've identified six study areas, two in Camden and four in Gloucester City. And this is the second operable unit at the site. The first operable unit we have dealt with is contaminated soil and right now we are in the clean-up phase of that remedy.

The second operable unit is the Armstrong Building, which is on the port area in Gloucester City and -- which is right here. The third operable unit deals with the surface water,

500094

Page 9

and we signed a Record of Decision back in 1995 -- I'm sorry -- 2005 that indicated that no further action was necessary for the surface water sediment and wetlands, and the groundwater will be addressed in the fourth operable unit. I think I have a slide about that later.

Back in 1885, Dr. Carl Auer von Welsbach invented a process to manufacture gas mantles using thorium, and thorium is a radioactive element that was used to make the mantles glow brighter when it was heated up. The Welsbach Company started producing mantles in the Gloucester City area in the 1890s, and around 1915, at their peak production, they opened up the new factory on Ellis and Essex Streets and they moved their operations into the Armstrong Building, and around 1940 they went out of business.

Here is a photo or an artist's rendition of the Welsbach facility back around 1900, and during their peak they had up to 2,600 employees and they had the capacity to make 220,000 gas mantles per day and 25,000 lamps, so it was quite a large company.

Back in 1981, EPA and the State sponsored an aerial radiological flyover of the

Page 10

Camden and Gloucester City areas. Back in, I guess, the early 1980s, the U.S Radium site up in northern New Jersey, where the radium was painted onto watch and dial faces -- well, the U.S Radium site bought thorium from -- or radium from Welsbach, and that's how they found out about the Welsbach site.

So this is a photo from the 1981 aerial flyover showing some of the elevated areas, and this is the Welsbach facility, and then we have the Swim Club, the Land Preserve, the Temple Avenue properties, and up in here is the General Gas Mantle facility in Camden.

This goes through the cleanup phases that I talked about earlier, and then the Armstrong Building is the last remaining building from Welsbach's operation. The property is currently owned by GMT Realty and the port facility is operated by Gloucester Terminals.

The Armstrong Building was built around 1915. It was masonry and reinforced concrete. It's six interconnected buildings, three stories tall, and has over 200,000 square feet of floor space, and currently only the first floor and a small area on the second floor are used for training and offices.

Page 11

Apparently, the building is in poor physical condition. The second and third floor walls and the third floor ceiling are open to the environment. And in May, 1997, EPA and the former operator of the port, Holt Hauling & Warehousing, entered into a Voluntary Administrative Order on Consent of EPA to perform an investigation of the Armstrong Building, and they completed that work in January, 2000.

In 2010, EPA came back and conducted a supplementary Remedial Investigation and we completed that Feasibility Study in July, and the Proposed Plan was put out for public comment on July 21st.

The investigation results on the building, we found radiologically-contaminated materials on the building surfaces, mostly in the second floor in Rooms 9, 10, 11 and 13, and on the third floor in a couple of the rooms there.

The primary contaminants of concern are thorium, which has a 14 billion year half-life. So the material here will not go away in any near time. Also we have Radium-226, which has a 16,000 year half-life. So we found mostly throughout the building Thorium-232, and in one room we did find

Page 12

radium, in Room 11.

One of the things that we found is that the contamination is only within the top eighth inch of the surface, so it's just basically surface contamination, and the radon levels -- we took some radon readings, and the radon readings were all below EPA's action level.

This shows a photo of before and after of the Welsbach operations, what it looked like back around 1917 and what those rooms look like today. You can see the women sewing the mantles in the mantle sewing room, and this was the mantle dipping room on the third floor and what it looks like today.

I'm going to turn it over to Marian to talk a little bit about risk assessment.

MS. OLSEN: Thank you.

As I mentioned, on every Superfund site we conduct a human health risk assessment. It provides the framework to help remedial managers make decisions about the need for action at the site or if there is no need for action, and in this case we are proposing that there is a need for action.

A risk assessment really combines two components. We are looking at exposure, how would an individual come into contact with the material, and the toxicity of the material, whether it's chemical or a radionuclide.

Under the Superfund process, we are required to develop a baseline risk assessment, and the risk assessment looks at the risk in the absence of any remediation. If we did absolutely nothing at this site, what are the risks?

We looked at it under both current and future conditions. And, as part of this risk assessment, we are looking at protection of the reasonably maximally exposed individual. This is not average exposures or worst case; but it's reasonable for this specific site that we are evaluating.

For the human health risk assessment, as part of the exposure we are looking at how do individuals -- how are they exposed and who is exposed, and we are also looking at what routes of exposure may occur. Are they contacting it through epidermal contact, or are they inhaling it or ingesting the materials? And, as part of this, we are looking at different individuals.

So, for example, in this risk assessment we looked at young children and adults

under a residential scenario and we looked at workers. So, as you may imagine, for example, exposure to workers, a worker may be there during the normal workday for 250 days per year. Fifty weeks of the year, times five days per week, so 250 days. But a resident would be there 350 days per year. So that's what we incorporated as part of our assessment, to look at these various exposures.

In addition, we looked at how long is that individual exposed. That's the duration of exposure. And, again, that may vary based on the activities at the site. So that is what is included as part of the risk assessment.

In addition, as I mentioned, we also looked at the toxicity of the chemicals, and those are developed -- we have programs within EPA that develop toxicity values that we use at all of our Superfund sites. We are looking at a risk range that provides a framework under the Superfund legislation and the regulations under which Superfund works to inform decisions, and we are looking at the risk to the reasonably maximally exposed individual.

We come out at the end of it with a calculated risk and we compare it to the risk range,

and that's the legislative requirement for making a decision.

So, in this case we did a variety of scenarios for the future residents as well as for the workers, and what we found is that, under an uncontrolled release and building demolition and reuse of the material as fill, that those risks were within the risk range.

However, under building reuse, we found that the risks were greater than the risk range in two of the rooms that were mentioned by Rick, Rooms 11 and 17, and this then provides information to move into the next step of the risk assessment, where decisions were made, such as those we are discussing tonight, about what remedial actions are appropriate.

So I'll turn it back to Rick, who is going to talk about the Feasibility Study, which was the next phase, and the proposed remedial action.

MR. ROBINSON: Thanks, Marian.

As Marian said, our next step will be we will look at -- now that we found that there is an unacceptable risk to human health, we then look at what are our Remedial Action Objectives, and our first one is to protect human health and the

environment from potential and future health risks.

And, for the Armstrong Building, our RAOs, or Remedial Action Objectives, are to prevent radiation exposure from radiological contamination on building material surfaces and to prevent future release of radioactive contamination from the building to the environment.

We developed three -- we evaluated three alternatives: The first one, no action, which is what we were required to conduct, and to compare the no action -- doing no action versus the other two alternatives. The second alternative is decontamination and off-site disposal, and that involves decontamination of the contaminated rooms that they identified, and the cost of that is about $3.5 million.

Then the demolition and off-site disposal alternative involves a controlled demolition process, basically demolishing the building piece by piece, so that we don't spread contamination from those -- in those rooms throughout the area. So that's the reason why that one costs $103 million.

We then take the alternatives and we evaluate them against the nine criteria, and the first two criteria are threshold criteria, which means that they have to be met in order for us to consider them as an alternative. That's the overall protection of human health and the environment, and in compliance with State and Federal regulations.

We then evaluate the remedies -- the alternatives based on the balancing criteria and the modifying criteria, and they are the long-term effectiveness and permanence; reduction of toxicity, mobility and volume; and the short-term effectiveness, along with the implementability and cost. Then the modifying criteria are the State acceptance and the community acceptance. We are all out today for this public meeting for the community to give us their input.

We then compared the three alternatives versus the nine criteria, and Alternative 1, the no action alternative, since it is not protective of human health and the environment, we've eliminated it from further consideration.

So, the overall protection of human health and the environment, compliance with State and Federal regulations, the long-term effectiveness and permanence of both Alternatives 2 and 3 are --

basically are equal in protectiveness. Whereas, the short -- the reduction of toxicity, mobility or volume, both alternatives do not meet that criteria. Currently there is no -- I guess there is no technology currently available that would reduce the toxicity, mobility and volume of the radioactive -- of the radiological contaminants of concern, so none of the alternatives can meet that threshold, that criteria.

The short-term effectiveness both -- what we'll term our effectiveness in the short term; however, both the implementability and cost of Alternative 2, is -- achieve those criteria better than the Alternative 3.

Implementability for the demolition, the -- it would be much more difficult to implement. You need a lot more room to stage, and being on an active port facility, it would be much more difficult to stage and conduct that type of a demolition.

Then the cost, 3 million, 3.5 million versus a hundred million, Alternative 2 is more preferable.

The alternative that we are selecting tonight -- or recommending is Alternative 2, the

decontamination, off-site disposal, the decontamination, through either physical or chemical measures, of the contaminated surfaces. Over on the left here we have a physical -- a scabbling machine that goes in and physically, like a floor sander that will sand the floor, remove the contamination from the upper surfaces of the material, and on the right side of the screen we have a chemical peel where they put down material and they peel off contamination on the surfaces.

We also will be conducting environmental testing to ensure the effectiveness of the remedy, and then we'll be disposing of all the waste at a licensed off-site facility, and the remedy is estimated to cost about 3.5 million.

And right now we are accepting public comments on this preferred alternative through August 22nd, and following that we'll be -- as Pat said earlier, we'll be preparing a response to the summary. We'll be responding to the questions that anybody has in writing or -- it would also include a transcript and a response -- our responses tonight will be included in that, and then we'll select the remedy and then -- we'll select a final remedy and then it will be documented in the Record of

Decision. And then, once the Record of Decision is signed, we will then start the design, and then after that the construction of the alternative.

So right now that's our presentation. If you have any written comments you'd like to submit, please send them to me, and we'll accept written comments through Monday, August 22nd.

So right now we'd like to open it up for questions on the Armstrong Building remedy. After this meeting we can discuss any other questions you may have on the project.

MS. SEPPI: Before you start with your questions, I forgot to give credit where credit is due in the opening.

As much as we would like to have you believe that EPA does all this work ourselves, it's absolutely not true. We work with other agencies and other companies, and they aren't represented here tonight, so I just wanted to mention their names. U.S. Army Corps of Engineers has representatives tonight. Malcolm Pirnie, who is one of our contractors, and also, Sevenson Environmental Services. So we work together with a team in order to get this work done.

MR. ROBINSON: And also the State of

Page 21

New Jersey partners with us on the clean-up. Representatives from the State could not attend tonight.
MS. SEPPI: And, just to remind you, please state your name before you ask your question, okay?
So, does anybody have any questions?
MR. HUTCHINSON: This is John Hutchinson.
What's going to be the use of the building once it's cleaned?
MR. ROBINSON: Basically, once the -- just to repeat the question, "What is going to be the use of the building once it's cleaned?"
It's basically -- we are going to free release the building, so, once we clean up the building, then it could be used for anything. So it's up to the property owner what they would like to do with the building.
MR. HUTCHINSON: So it would go back to the owner?
MR. ROBINSON: Yes, it would go back to the property owner.
MR. JAMES: William James.
How long do you think the project

Page 22

will take?
MR. ROBINSON: Well, the process is, once the ROD is signed and we go into the design phase, and then once we do the design phase, then it's the remedial action. The design phase --
MR. JAMES: I mean just the remedial action.
MR. ROBINSON: We are estimating it to be about a year. Lisa, about a year, right?
MS. SZEGEDI: Right.
MR. ROBINSON: About a year.
MR. JAMES: And I understand how these other projects go, when you dig a hole, it just gets deeper and deeper and deeper and wider and wider and wider. Is this not one of those type of projects? Is this absolutely contained?
MR. ROBINSON: This is a little bit more, as you say, contained. Let me go back to the slide here just to show you the rooms -- actually, I have a better slide at the end.
This is an example of one of the rooms where we did the -- this is one of the rooms where, when we were doing the RI -- this is some of the transects we did in the white line, and then we have that little red area there. This is one of the

Page 23

columns. So we scanned all these walls here and the only spot that we found that was contaminated was the area outlined in red.
And this area in here is a close-up of one of the areas that was elevated. We chipped off a small amount of contamination. That is now clean. So we did our -- we cleaned up this area by sampling.
So, once we identify an area with our meters, we find it, we clean it up, it's done. So this is a lot simpler, because there is not a lot of hidden stuff here.
When we are doing our soil clean-ups, we are -- sometimes it's like cleaning up the tip of the iceberg. Once you open up a hole in the ground, you don't know where it's going to fall. Here it's much more straightforward.
MR. AZZAM: And here what we've done, we collected some cores to assess the depth of the contamination in the floors and the walls and we found it's within like the first two inches, so...
MR. ROBINSON: Eighth of an inch.
MR. AZZAM: Eighth of an inch. So it's on the surface. It's not like it's going to be going inside the building structure, stuff like

Page 24

that.
MR. ROBINSON: Just as another note, the building itself, there are some rooms that are in really bad condition, but overall it's not -- the building is not in any imminent danger of collapsing. It's just that the room is open to the environment. In some of the rooms the walls are exposed, the ceilings are gone, the windows are broken out, so there is a risk that something could spread through that -- those mechanism and...
MR. JAMES: In the event -- God forbid, in the event of a fire, what are the possible consequences of that, as far as contamination to the neighborhood?
MR. ROBINSON: When we looked at the -- one of the things about --
MR. JAMES: It's an issue of public safety and for first responders.
MR. ROBINSON: Right. Well, we did do a -- that was one of the scenarios we did do in our risk assessment, and, when we looked at the risks from that scenario, they fell within the EPA's acceptable risk range, so it doesn't appear there would be a risk above what EPA would consider, you know -- what's the right word, Marian?

MS. OLSEN: It wasn't above our risk range.

MR. ROBINSON: Yes. So it would be within our acceptable risk range. We don't feel there is going to be any adverse risk.

MR. AZZAM: Most of the contamination sticks to solid concrete structures. You have some Sheetrock in there in the building that could burn up. There is only one small section where the roof is removable -- it's not significant -- so, if it catches on fire --

MR. ROBINSON: And the rooms that -- and one the other things, the rooms that are contaminated, they are not being used right now, there is nothing stored in those rooms, they are all vacant, and it's all concrete and masonry block, so there is really nothing to burn. There is no wood structures or wood beams or anything. Everything in this building is concrete.

MR. JAMES: But underneath it there is.

MR. ROBINSON: On the first floor, yes, the offices on the first floor, there is something underneath. But that's in the clean area.

MR. HUTCHINSON: John Hutchinson.

In light of these building fires in Camden, and looking at this, have there been any instructions for first responders for fire, EMTs, police responding to fires in this facility?

MR. ROBINSON: The areas that are where the contamination is located in -- and, again, there is no -- there is nothing in those areas that would be -- that a person would have to go into to fight a fire. You know, in the first floor --

MR. HUTCHINSON: When police officers are chasing people between the buildings, what's the exposure to the officers?

MR. ROBINSON: There is no exposure. Just, basically, if someone -- exposure comes when there is a release, and the only way this material -- most of the contamination is fixed within the concrete itself, so it's not on the surfaces. It's only one small room, in Room 11, where -- and it's a very small area, where there is removable contamination. That means, if you go and you touch it, you can get it on your hands. The rest of the stuff is fixed within the material, the concrete, itself.

So there would be no risk for anybody walking through it or going in there and doing

anything. Unless someone went in and started pounding on the concrete to create dust, that's basically what --

MR. HUTCHINSON: That's kind of my concern. If they are chasing a trespasser stealing copper piping in there with a piece of the wall, now we are going to have --

MR. ROBINSON: One issue where it helps for security is that this site is located on an active port, it is monitored 24 hours a day, Homeland Security, you need special access just to get in there, so there is -- I know that the facility is also going to be upgrading their security around the entire perimeter of the property, and -- so I think trespassers in the area is going to be not realistic in this situation.

MR. AZZAM: Just to add into it, in the buildings there, there could be a little bit of gamma radiation, but not -- the extent inside is insignificant, so you would get much less than a dental X-ray. In the case you have firefighters going inside for a few hours and then coming out, you will be getting much less than from a dental X-ray.

MR. HUTCHINSON: But there is a wide

range of scenarios that could be involved. You talk about part of the roof is missing, windows are missing, stuff like that. The building is deteriorated, so there is going to be more collapses which would make some of this stuff friable.

MR. ROBINSON: And that's why we are recommending to take an action and to do the clean-up here. Short term, we don't believe there is any risk, only long-term risks. If nothing was done with the building over a number of years, it could get worse and something could happen, but short term, the risks are not there.

MR. HUTCHINSON: Would there be any guidelines that go out to first responders in the event of any problem in that building?

MR. ROBINSON: We can talk to you about that at another time.

MR. WALKER: Dan Walker.

The three and a half million, does that cover repairing the roofs and walls?

MR. ROBINSON: No. The three and half million --

MR. WALKER: It's just the decon?

MR. ROBINSON: It's the decon. So the owner can do what they want with the building.

If they wanted to refurbish the building and reuse it, it would be acceptable to do that. If the owner wanted to demolish the building, they could demolish the building without having to worry about the radiation in the building. So, it gives them free range to do what they want to do with it.

MR. WALKER: So you are not fixing it?

MR. ROBINSON: We are not fixing it, no. We are just dealing with the radiological contamination of the building.

MR. BARBER: Vince Barber.

As part of your RI -- I mean, you've done the whole gamut, you've done soil samples as well as groundwater and things like that, and nothing showed up?

MR. ROBINSON: Well, the remedy for the soil is OU1. That was signed in 1999, and we've selected the remedy to excavate and dispose off-site all of the contaminated soils above five picocuries per gram.

MR. BARBER: From this location?

MR. ROBINSON: From the entire site. This is the building -- this here deals with the Armstrong Building itself, and it's just the

structure and the contamination within that structure. All the soils are OU1. This is OU2. OU3 was the surface water and the water bodies around it, and OU4 will be the groundwater.

So, once we complete the OU1 clean-up or the soil clean-up, which will be a number of years from now, but, once we complete that, then we'll go and look at the groundwater contamination.

It appears that, during our initial investigation in 1999, the -- when we sampled some of the groundwater, the groundwater was contaminated only in the area directly adjacent to where the contamination was. So, if we clean up the soils, the groundwater should clean up. We've seen that on other radiation sites, also. So that's why we are holding off on the groundwater investigation until the end.

The other thing is, the groundwater here is not used for drinking water purposes, and it's a shallow aquifer, so there is no risk to the public from the groundwater right now.

MR. BARBER: Just to follow-up on that, in your OU1, in the soil remediation activity, is any of that going to be conducted at this site?

MR. AZZAM: Yes.

MR. ROBINSON: Well, on the -- let me go back to the -- the site includes all the properties in these study areas here where we found radiological contamination. It's not the entire area. It's the properties where we find radiological contamination.

Now, the entire port property here -- we did find contamination on the entire port property. That remedy -- in the 1999 ROD, we say we are going to excavate all contaminated soils that are above our clean-up level. So right now where we are with the soil clean-up for the OU1 on the port property is that we are -- we are in the design phase right now. So we are -- we are studying the contamination and the extent of contamination on that property.

MR. BARBER: It's on your to-do list, but it hasn't taken place?

MR. ROBINSON: Correct. Right.

MR. BARBER: That's what I was getting at.

MR. ROBINSON: Yes. Okay.

MR. BARBER: We talked about the integrity of the building.

MR. ROBINSON: Right.

MR. BARBER: Any thought that the integrity of the building could have allowed any of this contamination to migrate through damaged areas, cracks, crevices, things like that, and it could have gone below?

MR. ROBINSON: We --

MR. BARBER: You haven't found that?

MR. ROBINSON: We haven't seen any contamination that's from the building out into the environment. We have not sampled beneath the building because it's inaccessible right now. So, if the current owner decides to knock the building down in the future, we would probably go in and say, well, let's take a sample just to confirm that there is nothing there.

MR. BARBER: So we really don't know?

MR. ROBINSON: We don't know. We do know that the building -- this is the original Welsbach factory. I believe this is probably Essex Street here or -- wait a minute. This is Essex?

Go to the other photo. Here we go. Here we have the Armstrong Building here. These buildings were taken down when they built the Walt Whitman Bridge. The old original factory was located over in here. They moved here around 1917.

Page 33

They purchased this property in 1915, somewhere in there, and they built this building. Welsbach didn't operate on this side of Essex Street until that time, so we don't think that there was contamination here at that time, but we just don't know.

MR. BARBER: You don't expect it, but you're just not sure?

MR. ROBINSON: We're not sure.

Next question?

MR. LAMBERSKY: Howard Lambersky.

Two questions. One, when EPA issues a letter of no further action on this Armstrong property, are there going to be any specific caveats for use? And, contained in the $3.5 million, is there going to be any supplemental monitoring of the site?

MR. ROBINSON: Okay. When -- do you want to repeat the first part?

MR. LAMBERSKY: Yes. Is there going to be any specific caveats to the use or -- of the building?

MR. ROBINSON: Once we do our clean-up we are doing what, as I said before, is a free release. We are taking all the contamination

Page 34

out -- our clean-up levels are based on a risk number, and any contamination above that number we will then -- you know, all the contamination basically will be out of the building and there will be no need for further study in the future or reviews or anything like that.

So all the contamination, as far as we are concerned, is gone, free released, the building owner can do what he wants with the property.

MR. LAMBERSKY: So there will not be any supplemental monitoring after that?

MR. ROBINSON: No. Only during -- what we will be doing, after we complete our cleanup, we'll be conducting what we call a final status survey, which will document that we got it all out.

MR. LAMBERSKY: Okay.

MR. ROBINSON: And the second of part of your question?

MR. LAMBERSKY: The second part of my question is -- actually, it's changed. Because of redevelopment, okay -- that's my main -- my concern, redevelopment --

MR. ROBINSON: Um-hum.

Page 35

MR. LAMBERSKY: -- is the Armstrong Building going to be, like you said, clear for redevelopment? EPA is going to issue a no further action letter --

MR. ROBINSON: Right.

MR. LAMBERSKY: -- and no additional monitoring, okay, no supplemental monitoring, okay, is included in the price of the remediation, correct?

MR. ROBINSON: Yes.

MR. LAMBERSKY: So, on that, if we use this as a baseline, other sites that you are looking at in the study -- in the Welsbach project -- you know, we are changing flood plains -- the flood plain in the Camden and Gloucester City area is changing, so the contamination that was studied back in 1991 for soil and groundwater is not relevant anymore.

Would you go back and do additional soil and groundwater sampling in this project, or not?

MR. ROBINSON: We are continuing evaluating all areas where there is radiological contamination on the soils throughout our study area.

Page 36

MR. LAMBERSKY: Okay.

MR. ROBINSON: We have cleaned up most of all of the residue of the properties that are residential in nature. We still have a couple of properties still to go, but, for the most part, our cleanups are complete, along with the Swim Club, the Land Preserve. We just completed the northern ball fields. We are now in the restoration phase on that.

In Camden we are completing the cleanup of the General Gas Mantle facility area. That will be completed. We have one or two more properties up in Camden to do. Then we have a larger commercial property that will -- we still have to conduct further design investigations on and further remedial designs, and then we'll get to the remedial construction, hopefully, in the future on those.

MR. LAMBERSKY: No time frame on that, though?

MR. ROBINSON: Time frame depends on our funding, depends on a number of things.

MR. LAMBERSKY: Okay. Thank you.

MR. ROBINSON: No more questions?

We thank you all for coming. If

you'd like, we could talk about some of the aspects of our cleanup, what we are actually doing right now, and some of the other things, if you want, just to give you a little bit of an overview on that, but, for the court reporter, again, thank you, and thank you all for coming.

(7:49 p.m.)

C E R T I F I C A T E

I, Sean M. Fallon, a Certified Court Reporter and Notary Public of the State of New Jersey, do hereby certify that prior to the commencement of the examination, the witness and/or witnesses were sworn by me to testify to the truth and nothing but the truth.

I do further certify that the foregoing is a true and accurate computer-aided transcript of the testimony as taken stenographically by and before me at the time, place and on the date hereinbefore set forth.

I do further certify that I am neither of counsel nor attorney for any party in this action and that I am not interested in the event nor outcome of this litigation.

____
Certified Court Reporter
XI00840
Notary Public of New Jersey
My commission expires 4-29-13

Dated: ________________

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$103 (1) 16:23
$3.5 (2) 16:16;33:15

1

1 (1) 17:18
10 (1) 11:18
11 (4) 11:18;12:1;15:12;26:18
13 (1) 11:18
14 (1) 11:21
16,000 (1) 11:23
17 (1) 15:12
1885 (1) 9:7
1890s (1) 9:13
1900 (1) 9:19
1915 (3) 9:13;10:20;33:1
1917 (2) 12:10;32:25
1940 (1) 9:17
1980s (1) 10:2
1981 (2) 9:24;10:7
1991 (1) 35:17
1995 (1) 9:1
1997 (1) 11:4
1999 (3) 29:18;30:10;31:9

2

2 (5) 4:7;17:25;18:13,22,25
2,600 (1) 9:20
200,000 (1) 10:22
2000 (1) 11:9
2005 (1) 9:2
2010 (1) 11:10
21st (1) 11:14
220,000 (1) 9:21
22nd (2) 19:18;20:7
24 (1) 27:10
25,000 (1) 9:22
250 (2) 14:4,5

3

3 (3) 17:25;18:14,21
3.5 (2) 18:21;19:15
350 (1) 14:6

7

7:49 (1) 37:7

9

9 (1) 11:18

A

above (5) 24:24;25:1;29:20;31:11;34:2
absence (1) 13:6
absolutely (3) 13:7;20:17;22:16
accept (1) 20:6
acceptable (3) 24:23;25:4;29:2
acceptance (2) 17:13,13
accepting (1) 19:16
access (1) 27:11
achieve (1) 18:13
action (19) 7:9;8:3;9:3;12:7,21,22,23;15:19,24;16:3,9,11,11;17:18;22:5,7;28:7;33:13;35:4
actions (1) 15:16
active (2) 18:18;27:10
activities (1) 14:12
activity (1) 30:23
actual (1) 7:7
actually (4) 5:3;22:19;34:22;37:2
add (1) 27:17
addition (2) 14:9,14
additional (2) 35:6,19
addressed (1) 9:4
adjacent (1) 30:12
Administrative (1) 11:6
adults (1) 13:25
adverse (1) 25:5
aerial (2) 9:25;10:8
again (9) 3:23;4:2;6:3;7:3,21;8:1;14:11;26:6;37:5
against (1) 16:25
agencies (1) 20:17
agenda (1) 5:17
ago (1) 6:17
allowed (1) 32:2
along (2) 17:11;36:6
already (1) 5:21
alternative (12) 16:12,18;17:3,18,18;18:13,14,22,24,25;19:17;20:3
alternatives (13) 5:1,25;6:24;7:20,25;16:9,12,24;17:7,17,25;18:3,8
amount (1) 23:6
another (2) 24:2;28:17
answer (1) 4:20
answered (1) 3:8
answers (2) 5:14;7:6
anybody (3) 19:21;21:7;26:24
anymore (1) 35:18
anything (4) 21:17;25:18;27:1;34:6
anywhere (1) 8:5
Apparently (1) 11:1
appear (1) 24:23
appears (1) 30:9
appreciate (1) 6:4
appropriate (1) 15:16
aquifer (1) 30:20
area (17) 8:23;9:13;10:24;16:22;22:25;23:3,4,7,9;25:24;26:19;27:15;30:12;31:5;35:16,25;36:11
areas (9) 8:16;10:1,8;23:5;26:5,7;31:3;32:3;35:23
Armstrong (13) 3:11;4:4;8:23;9:16;10:14,19;11:8;16:2;20:9;29:25;32:22;33:13;35:1
Army (1) 20:20
around (8) 9:13,16,19;10:20;12:10;27:14;30:4;32:25
arrow (1) 7:2
artist's (1) 9:18
ask (5) 3:10,23;4:9;5:4;21:5
aspects (1) 37:1
assess (1) 23:19
assessment (14) 4:16;5:23;12:16,19,24;13:5,6,11,16,25;14:8,13;15:14;24:21
Assessor (1) 4:12
assigned (1) 4:12
attend (1) 21:2
Auer (1) 9:7
August (2) 19:18;20:7
availability (1) 5:6
available (2) 6:6;18:5
Avenue (1) 10:10
average (1) 13:13
away (1) 11:22
Azzam (7) 4:17,17;23:18,23;25:6;27:17;30:25

B

back (15) 5:24;9:1,7,19,24;10:1;11:10;12:10;15:17;21:21,22;22:18;31:2;35:17,19
background (1) 5:20
bad (1) 24:4
balancing (1) 17:7
ball (1)

36:8
Barber (11)
29:12,12,22;30:22;31:17,20,23;32:1,7,16;33:7
based (3)
14:11;17:7;34:1
baseline (2)
13:5;35:12
basically (8)
12:4;16:19;18:1;21:12,15;26:14;27:3;34:4
beams (1)
25:18
because (4)
3:18;23:11;32:11;34:22
before (4)
12:8;20:12;21:5;33:24
being (2)
18:17;25:14
believe (3)
20:16;28:8;32:19
below (2)
12:7;32:5
beneath (1)
32:10
best (2)
5:25;8:1
better (2)
18:13;22:20
between (2)
7:2;26:11
billion (1)
11:21
binding (3)
5:12;7:4;8:2
bit (7)
5:5,19,23;12:16;22:17;27:18;37:4
block (1)
25:16
bodies (1)
30:3
both (7)
4:14;8:15;13:9;17:25;18:3,10,12
bought (1)
10:4
Bridge (1)
32:24
brighter (1)
9:11
broken (1)
24:9
Building (53)
3:12;4:4;8:23;9:16;10:15,15,19;11:1,8,16,17,25;15:6,9;16:2,5,7,20;20:9;21:11,14,16,17,19;23:25;24:3,5;25:8,19;26:1;28:3,10,15,25;29:1,3,4,5,11,24,25;31:24;32:2,9,11,12,18,22;33:2,22;34:4,9;35:2
buildings (4)
10:21;26:11;27:18;32:23
built (3)
10:19;32:23;33:2
burn (2)
25:8,17
business (1)
9:17

C

calculated (1)
14:25
call (1)
34:15
called (3)
5:11,13;6:20
Camden (8)
8:15,17;10:1,12;26:2;35:15;36:10,13
came (1)
11:10
can (11)
3:10,13;4:19;7:12;12:11;18:8;20:10;26:21;28:16,25;34:9
capacity (1)
9:21
Carl (1)
9:7
case (4)
12:22;13:13;15:3;27:21
catches (1)
25:11
caveats (2)
33:14,21
ceiling (1)
11:3
ceilings (1)
24:8
certainly (1)
3:10
changed (1)
34:22
changing (2)
35:14,16
chasing (2)
26:11;27:5
chemical (3)
13:3;19:2,8
chemicals (1)
14:15
children (1)
13:25
chipped (1)
23:5
cities (1)
8:15
City (6)
8:16,17,24;9:13;10:1;35:15
clean (7)
7:8;21:16;23:7,10;25:24;30:13,14
cleaned (4)
21:11,14;23:7;36:2
cleaning (1)
23:14
cleanup (4)
10:13;34:15;36:11;37:2
clean-up (13)
3:11;4:3;7:9,21;8:20;21:1;28:8;30:5,6;31:11,12;33:24;34:1
cleanups (1)
36:6
clean-ups (1)
23:13
clear (1)
35:2
close-up (1)
23:4
Club (2)
10:10;36:6
collapses (1)
28:4
collapsing (1)
24:6
collected (1)
23:19
columns (1)
23:1
combines (1)
12:24
come (2)
13:1;14:24
comes (1)
26:14
coming (3)
27:22;36:25;37:6
comment (1)
11:13
comments (11)
3:18,20;5:1,4,9,15;7:7,25;19:17;20:5,7
commercial (1)
36:14
Community (3)
4:6;17:13,14
companies (1)
20:18
Company (2)
9:12,23
compare (2)
14:25;16:10
compared (1)
17:16
complete (5)
7:10;30:5,7;34:14;36:6
completed (4)
11:8,12;36:7,12
completing (1)
36:10
compliance (2)
17:5,23
components (1)
12:25
concern (4)
11:20;18:7;27:5;34:23
concerned (1)
34:8
concrete (7)
10:21;25:7,16,19;26:17,23;27:2
condition (2)
11:2;24:4
conditions (1)
13:10
conduct (4)
12:19;16:10;18:19;36:15
conducted (2)
11:10;30:24
conducting (2)
19:11;34:15
confirm (1)
32:14
Consent (1)
11:7
consequences (1)
24:13
consider (2)
17:3;24:24
consideration (1)
17:21
construction (3)
7:10;20:3;36:17
contact (2)
13:1,21
contacting (1)
13:20
contained (3)
22:16,18;33:15
contaminants (2)
11:20;18:7
contaminated (8)
8:19;16:14;19:3;23:2;25:14;29:20;30:11;31:10
contamination (34)
7:18,19;12:3,5;16:4,6,21;19:6,10;23:6,20;24:14;25:6;26:6,16,20;29:11;30:1,8,13;31:4,6,8,15,15;32:3,9;33:5,25;34:2,3,7;35:16,24
continuing (1)
35:22
contractors (1)
20:22
controlled (1)
16:18
Coordinator (1)
4:7
copper (1)
27:6
copy (1)
6:12
cores (1)
23:19
Corps (1)
20:20
Correct (2)
31:19;35:9
cost (5)
16:15;17:12;18:12,21;19:15
costs (1)
16:23
could (14)
3:6,23;21:2,17;24:9;25:8;27:18;28:1,11,11;29:3;32:2,4;37:1
country (1)
6:20
couple (2)
11:19;36:4
court (1)

37:5
cover (1) 28:20
cracks (1) 32:4
create (1) 27:2
credit (2) 20:13,13
crevices (1) 32:4
criteria (10) 16:25;17:1,1,7,8,12,17;18:3,9,13
current (2) 13:9;32:12
currently (5) 4:14;10:16,23;18:4,5

D

damaged (1) 32:3
Dan (1) 28:18
danger (1) 24:5
day (2) 9:22;27:10
days (4) 14:4,5,6,6
dealing (1) 29:10
deals (2) 8:25;29:24
dealt (1) 8:19
decides (1) 32:12
Decision (10) 5:12;7:3,6,15;8:2,8;9:1;15:2;20:1,1
decisions (3) 12:21;14:21;15:14
decon (2) 28:23,24
decontamination (4) 16:13,14;19:1,2
deeper (3) 22:14,14,14
delete (1) 7:10
delineate (1) 7:18
demolish (2) 29:3,3
demolishing (1) 16:19
demolition (5) 15:6;16:17,19;18:15,20
dental (2) 27:21,23
depends (2) 36:21,22
depth (1) 23:19
describe (1) 4:10
design (9) 7:7;8:3,4;20:2;22:3,4,5;31:13;36:15
designs (1) 36:16
deteriorated (1) 28:4
determination (1) 6:25
develop (2) 13:5;14:17
developed (2) 14:16;16:8
dial (1) 10:4
did (9) 11:25;13:7;15:3;22:22,24;23:7;24:19,20;31:8
didn't (1) 33:3
different (2) 7:20;13:23
difficult (2) 18:16,19
dig (1) 22:13
dipping (1) 12:13
directly (1) 30:12
discuss (2) 4:13;20:10
discussing (1) 15:15
disposal (3) 16:13,18;19:1
dispose (1) 29:19
disposing (1) 19:13
do (23) 3:2,12;5:24;6:20;7:17;13:17;18:3;21:19,25;22:4;24:20,20;28:7,25;29:2,6,6;32:17;33:18,23;34:9;35:19;36:13
document (5) 5:11,12,13;8:2;34:16
documented (1) 19:25
documents (4) 6:5,6,9;7:4
does (3) 20:16;21:7;28:19
doesn't (1) 24:23
doing (8) 7:9;16:11;22:23;23:13;26:25;33:24;34:14;37:2
done (7) 5:22;20:24;23:10,18;28:10;29:14,14
don't (10) 3:25;16:20;23:16;25:4;28:8;32:16,17;33:4,5,7
down (3) 19:9;32:13,23
Dr (1) 9:7
drinking (1) 30:19
due (1) 20:14
duration (1) 14:10
during (4) 9:20;14:3;30:9;34:13
dust (1) 27:2

E

earlier (2) 10:14;19:19
early (1) 10:2
effectiveness (6) 17:9,11,24;18:10,11;19:12
effects (1) 4:14
eighth (3) 12:3;23:22,23
either (1) 19:2
element (1) 9:10
elevated (2) 10:8;23:5
eliminated (1) 17:20
Ellis (1) 9:15
employees (1) 9:20
EMTs (1) 26:3
end (4) 3:6;14:24;22:20;30:17
Engineers (1) 20:20
ensure (1) 19:12
entered (1) 11:6
entire (5) 27:14;29:23;31:4,7,8
environment (8) 11:4;16:1,7;17:4,20,23;24:7;32:10
environmental (2) 19:12;20:22
EPA (13) 4:7,8,22;5:25;9:24;11:4,7,10;14:16;20:16;24:24;33:12;35:3
EPA's (2) 12:7;24:22
epidermal (1) 13:21
equal (1) 18:1
Essex (4) 9:15;32:19,20;33:3
estimated (1) 19:15
estimating (1) 22:8
evaluate (2) 16:25;17:6
evaluated (1) 16:8
evaluating (2) 13:15;35:23
event (3) 24:11,12;28:15
Eventually (1) 7:10
every (1) 12:18
everybody (1) 3:22
Everything (1) 25:18
example (3) 13:24;14:2;22:21
excavate (2) 29:19;31:10
expect (1) 33:7
explain (1) 5:25
exposed (6) 13:12,18,19;14:10,23;24:8
exposure (10) 4:15;12:25;13:17,20;14:3,11;16:4;26:12,13,14
exposures (2) 13:13;14:8
extent (3) 7:18;27:19;31:15

F

faces (1) 10:4
facility (9) 9:19;10:9,12,17;18:18;19:14;26:4;27:13;36:11
factory (3) 9:14;32:19,24
fall (1) 23:16
far (3) 7:12;24:13;34:7
Feasibility (4) 6:22,24;11:12;15:18
Federal (2) 17:5,24
feel (2) 7:25;25:4
feels (1) 5:25
feet (1) 10:22
fell (1) 24:22
few (3) 4:8,16;27:22
field (1) 8:9
fields (1) 36:8

Fifty (1) 14:4
fight (1) 26:9
fill (1) 15:7
final (4) 5:11;7:1;19:24;34:15
find (4) 11:25;23:10;31:5,8
finished (3) 3:14;6:23;7:22
fire (4) 24:12;25:11;26:3,9
firefighters (1) 27:21
fires (2) 26:1,4
first (14) 3:24;8:18;10:23;15:25;16:9;17:1;23:21;24:18;25:22,23;26:3,9;28:14;33:19
five (2) 14:5;29:20
fixed (2) 26:16,22
fixing (2) 29:7,9
flood (2) 35:14,15
floor (14) 3:10;10:23,23,24;11:2,3,18,19;12:13;19:5,6;25:22,23;26:9
floors (1) 23:20
flyover (2) 9:25;10:8
following (1) 19:18
follow-up (1) 30:22
forbid (1) 24:12
forget (1) 3:25
forgot (1) 20:13
former (1) 11:4
found (11) 10:6;11:16,24;12:2;15:5,10,22;23:2,21;31:3;32:7
four (1) 8:17
fourth (1) 9:5
frame (2) 36:19,21
framework (2) 12:20;14:19
free (4) 21:16;29:5;33:25;34:8
friable (1) 28:5
from (22) 4:15;7:11;8:5,7;10:5,5,7,15;16:1,4,6,21;17:20;19:7;21:2;24:22;27:23;29:22,23;30:7,21;32:9
funding (1) 36:22
further (7) 9:2;17:20;33:13;34:5;35:3;36:15,16
future (8) 4:14;13:10;15:4;16:1,5;32:13;34:5;36:17

G

gamma (1) 27:19
gamut (1) 29:14
Gas (5) 8:14;9:8,21;10:11;36:11
general (3) 3:13;10:11;36:11
get (8) 3:8;8:8;20:24;26:21;27:12,20;28:11;36:16
gets (1) 22:14
getting (2) 27:23;31:21
give (5) 3:24;8:11;17:15;20:13;37:4
gives (1) 29:5
giving (1) 4:22
Gloucester (7) 8:16,17,24;9:12;10:1,18;35:15
glow (1) 9:10
GMT (1) 10:17
go (20) 5:16,24;6:11;7:7;11:22;21:20,22;22:3,13,18;26:8,20;28:14;30:8;31:2;32:13,21,21;35:19;36:5
God (1) 24:11
goes (2) 10:13;19:5
going (27) 5:17,18,22;7:8,13;12:15;15:18;21:10,13,15;23:16,24,25;25:5;26:25;27:7,13,16,22;28:4;30:24;31:10;33:14,16,20;35:2,3
gone (3) 24:8;32:5;34:8
good (1) 6:10
gram (1) 29:21
greater (1) 15:10
ground (1) 23:15
groundwater (12) 9:4;29:15;30:4,8,11,11,14,16,18,21;35:17,20
guess (2) 10:1;18:4
guidelines (1) 28:14

H

had (2) 9:20,21
half (2) 28:19,22
half-life (2) 11:21,24
hands (1) 26:21
happen (3) 7:13;8:7;28:11
happened (1) 6:17
happens (1) 3:7
has (5) 10:22;11:21,23;19:21;20:20
hasn't (1) 31:18
Hauling (1) 11:5
have (44) 3:4,12,16,24;4:8,18;5:3,6,8,16;6:2,7,9,10;7:5;8:3,19;9:5;10:9;11:23;14:16;17:2;19:4,8;20:5,11,15;21:7;22:20,25;25:7;26:2,8;27:7,21;32:2,5,10,22;36:2,4,12,13,15
haven't (2) 32:7,8
having (1) 29:4
Health (12) 4:12,14,18;7:19;12:19;13:16;15:23,25;16:1;17:4,19,23
hearing (1) 4:25
heated (1) 9:11
Hello (1) 4:11
help (1) 12:20
helps (1) 27:9
here (30) 3:17,18;4:3;5:8;6:24;7:22;8:24;9:18;10:11;11:22;19:4;20:19;22:19;23:1,4,12,16,18;28:8;29:24;30:19;31:3,7;32:20,21,22,22,25,25;33:5
hidden (1) 23:12
history (2) 5:19;8:12
hold (2) 3:6;6:3
holding (1) 30:16
hole (2) 22:13;23:15
Holt (1) 11:5
Homeland (1) 27:11
hope (2) 3:3;4:19
hopefully (2) 8:7;36:17
hours (2) 27:10,22
Howard (1) 33:11
However (2) 15:9;18:12
Human (8) 4:12;12:19;13:16;15:23,25;17:4,19,22
hundred (1) 18:22
HUTCHINSON (9) 21:8,9,20;25:25,25;26:10;27:4,25;28:13

I

iceberg (1) 23:15
identified (3) 6:20;8:16;16:15
identify (1) 23:9
imagine (1) 14:2
imminent (1) 24:5
implement (1) 18:16
implementability (3) 17:11;18:12,15
inaccessible (1) 32:11
inch (3) 12:4;23:22,23
inches (1) 23:21
include (1) 19:21
included (3) 14:12;19:23;35:8
includes (1) 31:2
incorporated (1) 14:7
indicated (1) 9:2
individual (4) 13:1,12;14:10,23
individuals (2) 13:18,23
inform (1) 14:21
informal (1)

5:5
information (5)
4:19;5:7;6:11;8:11;15:13
ingesting (1)
13:22
inhaling (1)
13:21
initial (1)
30:9
input (1)
17:15
inside (3)
23:25;27:19,22
insignificant (1)
27:20
instructions (1)
26:3
integrity (2)
31:24;32:2
interconnected (1)
10:21
interested (1)
4:25
into (10)
7:7;8:9;9:16;11:6;13:1;15:13;22:3;26:8;27:17;32:9
introduce (1)
4:9
invented (1)
9:8
investigate (1)
7:17
investigation (8)
6:16,21;7:16;11:7,11,15;30:10,16
investigations (2)
5:22;36:15
involved (1)
28:1
Involvement (1)
4:7
involves (2)
16:14,18
issue (4)
5:10;24:17;27:8;35:3
issues (3)
4:19,23;33:12

J

James (7)
21:24,24;22:6,12;24:11,17;25:20
January (1)
11:9
Jersey (2)
10:3;21:1
John (2)
21:8;25:25
July (2)
11:12,13
just (24)
5:17;6:23;7:22;12:4;20:19;21:4,13;22:6,14,19;24:2,6;26:14;27:11,17;28:23;29:10,25;30:22;32:14;33:5,8;36:7;37:3

K

keep (1)
6:8
kind (1)
27:4
knock (1)
32:12
know (15)
3:20;5:21;6:17;7:7,20;23:16;24:25;26:9;27:12;32:16,17,18;33:6;34:3;35:14

L

LAMBERSKY (12)
33:11,11,20;34:11,18,21;35:1,6,11;36:1,19,23
lamps (1)
9:22
Land (2)
10:10;36:7
large (1)
9:23
larger (1)
36:14
last (1)
10:15
later (2)
3:20;9:6
left (1)
19:4
legally (3)
5:12;7:3;8:2
legislation (1)
14:20
legislative (1)
15:1
less (2)
27:20,23
letter (2)
33:13;35:4
level (2)
12:7;31:11
levels (2)
12:5;34:1
libraries (1)
6:8
licensed (1)
19:14
light (1)
26:1
like (21)
3:5;4:9;5:6;12:10,10,14;19:5;20:5,8,15;21:18;23:14,21,24,25;28:3;29:15;32:4;34:6;35:2;37:1
line (1)
22:24
Lisa (1)
22:9
List (4)
6:18,19;7:11;31:17
little (9)
5:5,19,23;8:11;12:16;22:17,25;27:18;37:4
local (1)
6:8
located (4)
8:15;26:6;27:9;32:25
location (1)
29:22
long (3)
3:5;14:9;21:25
long-term (3)
17:8,24;28:9
look (8)
6:6;7:19,20;12:10;14:8;15:22,23;30:8
looked (8)
12:9;13:9,25;14:1,9,15;24:15,21
looking (11)
6:11,25;12:25;13:11,17,19,23;14:18,22;26:2;35:13
looks (2)
12:13;13:6
lot (5)
3:7;5:21;18:17;23:11,11
lots (1)
6:6

M

machine (1)
19:4
made (1)
15:14
main (1)
34:23
make (5)
6:25;9:10,21;12:21;28:5
making (1)
15:1
Malcolm (1)
20:21
manager (1)
4:22
managers (1)
12:20
Mantle (5)
8:14;10:11;12:12,12;36:11
mantles (5)
9:9,10,12,22;12:11
manufacture (1)
9:8
many (3)
6:17;7:16,16
Marian (6)
4:11;5:22;12:15;15:20,21;24:25
masonry (2)
10:20;25:16
material (9)
11:22;13:1,2;15:7;16:5;19:7,9;26:16,22
materials (2)
11:17;13:22
maximally (2)
13:12;14:22
may (7)
5:5;11:4;13:20;14:2,3,11;20:11
mean (2)
22:6;29:13
means (2)
17:2;26:20
measures (1)
19:3
mechanism (1)
24:10
meet (2)
18:3,8
meeting (4)
3:4;5:4;17:14;20:10
meetings (2)
3:3;5:5
mention (2)
3:2;20:19
mentioned (3)
12:18;14:14;15:11
met (1)
17:2
meters (1)
23:10
migrate (1)
32:3
million (9)
16:16,23;18:21,21,22;19:15;28:19,22;33:15
minute (1)
32:20
minutes (1)
4:16
missing (2)
28:2,3
mobility (3)
17:10;18:2,6
modifying (2)
17:8,12
Monday (1)
20:7
monitored (1)
27:10
monitoring (4)
33:16;34:12;35:7,7
months (2)
7:17;8:5
more (10)
5:5;18:16,17,18,22;22:18;23:17;28:4;36:12,24
Most (6)
5:4;8:4;25:6;26:16;36:3,5
mostly (2)
11:17,24
move (1)
15:13
moved (2)
9:15;32:25
much (6)
18:16,18;20:15;23:17;27:20,23

N

name (4)
3:24;4:6,11;21:5
names (1)
20:20

National (2)
6:18;7:11
nature (1)
36:4
near (1)
11:22
necessary (1)
9:3
need (6)
12:21,22,23;18:17;27:11;34:5
neighborhood (1)
24:14
new (3)
9:14;10:3;21:1
next (6)
6:1;7:13;15:13,19,21;33:10
Nidal (1)
4:17
nine (3)
8:5;16:25;17:17
no (23)
9:2;12:22;16:9,11,11;17:18;18:4,4;25:17;26:7,13,24;28:21;29:10;30:20;33:13;34:5,13;35:3,6,7;36:19,24
none (1)
18:7
normal (1)
14:4
northern (2)
10:2;36:7
not (28)
3:5;11:22;13:13;17:19;18:3;20:17;21:2;22:15;23:11,24;24:4,5;25:10,14;26:17;27:16,19;28:12;29:7,9;30:19;31:4;32:10;33:8,9;34:11;35:17,21
note (1)
24:2
nothing (7)
13:7;25:15,17;26:7;28:9;29:16;32:15
notice (1)
3:16
Now (19)
6:23;7:14;8:11,20;15:22;19:16;20:4,8;23:6;25:14;27:6;30:7,21;31:7,11,14;32:11;36:8;37:3
number (5)
28:10;30:6;34:2,2;36:22

O

Objectives (2)
15:24;16:3
occur (1)
13:20
off (3)
19:9;23:6;30:16
officers (2)
26:10,12
offices (2)
10:25;25:23
official (2)
3:15,19
off-site (5)
16:13,17;19:1,14;29:19
Okay (10)
4:24;21:6;31:22;33:18;34:18,23;35:7,7;36:1,23
old (1)
32:24
OLSEN (4)
4:11,12;12:17;25:1
Once (13)
5:10;20:1;21:11,12,14,16;22:3,4;23:9,15;30:5,7;33:23
One (22)
3:1;5:2;6:10;11:25;12:2;15:25;16:9,23;20:21;22:15,21,22,25;23:5;24:16,20;25:9,13;26:18;27:8;33:12;36:12
ones (1)
8:1
only (10)
5:2;10:23;12:3;23:2;25:9;26:15,18;28:9;30:12;34:13
onto (1)
10:3
open (5)
3:10;11:3;20:8;23:15;24:6
opened (1)
9:14
opening (1)
20:14
operable (5)
8:18,19,22,25;9:5
operate (1)
33:3
operated (1)
10:18
operation (1)
10:16
operations (2)
9:16;12:9
operator (1)
11:5
Order (3)
11:6;17:2;20:23
original (2)
32:18,24
other (14)
3:12;4:8;6:5;16:11;20:10,17,18;22:13;25:13;30:15,18;32:21;35:12;37:3
OU1 (5)
29:18;30:2,5,23;31:12
OU2 (1)
30:2
OU3 (1)
30:3
OU4 (1)
30:4
ourselves (1)
20:16
out (13)
8:8;9:17;10:6;11:13;14:24;17:14;24:9;27:22;28:14;32:9;34:1,4,17
outlined (1)
23:3
over (6)
8:10;10:22;12:15;19:3;28:10;32:25
overall (3)
17:3,22;24:4
overview (1)
37:4
owned (1)
10:17
owner (7)
21:18,21,23;28:25;29:2;32:12;34:9

P

painted (1)
10:3
part (15)
3:15,19;4:4;5:13;13:10,17,22;14:7,13;28:2;29:13;33:19;34:19,21;36:5
partners (1)
21:1
past (1)
6:19
Pat (3)
4:6;8:13;19:18
peak (2)
9:14,20
peel (2)
19:8,9
people (2)
4:8;26:11
per (5)
9:22;14:4,5,6;29:21
perform (1)
11:7
perimeter (1)
27:14
permanence (2)
17:9,25
person (1)
26:8
phase (7)
8:20;15:19;22:4,4,5;31:14;36:8
phases (1)
10:13
photo (4)
9:18;10:7;12:8;32:21
physical (3)
11:2;19:2,4
physically (1)
19:5
physicist (1)
4:18
picocuries (1)
29:20
piece (3)
16:20,20;27:6
piping (1)
27:6
Pirnie (1)
20:21
place (2)
6:11;31:18
plain (1)
35:15
plains (1)
35:14
Plan (4)
6:12;7:15,23;11:13
please (4)
3:23,24;20:6;21:5
pm (1)
37:7
police (2)
26:4,10
poor (1)
11:1
port (8)
8:23;10:17;11:5;18:18;27:10;31:7,8,12
possible (1)
24:13
possibly (1)
3:6
potential (2)
4:13;16:1
pounding (1)
27:2
preferable (1)
18:23
preferred (2)
5:1;19:17
preparing (1)
19:19
present (1)
4:23
presentation (5)
3:4,7,9;4:23;20:4
Preserve (2)
10:10;36:7
prevent (2)
16:3,5
price (1)
35:8
primary (1)
11:20
Priorities (2)
6:18;7:11
probably (5)
5:20;8:6,6;32:13,19
problem (1)
28:15
process (7)
3:21;5:18;6:15;9:8;13:4;16:19;22:2
producing (1)
9:12
production (1)
9:14
programs (1)
14:16
project (7)
4:18,22;5:3;20:11;21:25;35:14,20
projects (2)
22:13,16
properties (6)
10:11;31:3,5;36:3,5,

13
property (12) 10:16;21:18,23;27:15;31:7,9,13,16;33:1,14;34:10;36:14
Proposed (5) 6:12;7:15,23;11:13;15:19
proposing (1) 12:23
protect (1) 15:25
protection (3) 13:11;17:4,22
protective (1) 17:19
protectiveness (1) 18:1
provides (3) 12:20;14:19;15:12
public (8) 5:3,6;7:25;11:13;17:14;19:16;24:17;30:21
purchased (1) 33:1
purposes (1) 30:19
put (3) 6:18;11:13;19:9

Q

question (6) 6:2;21:5,13;33:10;34:20,22
questions (16) 3:6,8,11,12,14,23;4:19;5:15;6:3;19:20;20:9,11,13;21:7;33:12;36:24
quickly (1) 5:17
quite (1) 9:22

R

radiation (4) 16:4;27:19;29:5;30:15
radioactive (3) 9:9;16:6;18:6
radiological (7) 9:25;16:4;18:7;29:10;31:4,6;35:23
radiologically-contaminated (1) 11:16
radionuclide (1) 13:3
Radium (5) 10:2,3,4,5;12:1
Radium-226 (1) 11:23
radon (3) 12:5,6,6
range (9) 14:18,25;15:8,11;24:23;25:2,4;28:1;29:6
RAOs (1) 16:3
readings (2) 12:6,6
ready (1) 8:8
realistic (1) 27:16
really (5) 3:5;12:24;24:4;25:17;32:16
Realty (1) 10:17
reason (3) 3:17;4:2;16:22
reasonable (1) 13:14
reasonably (2) 13:12;14:22
receive (1) 5:10
recommending (2) 18:25;28:7
record (13) 3:15,19,25;5:8,12;7:3,5,15;8:1,8;9:1;19:25;20:1
red (2) 22:25;23:3
redevelopment (3) 34:23,24;35:3
reduce (1) 18:5
reduction (2) 17:9;18:2
reflect (1) 7:6
refurbish (1) 29:1
Region (1) 4:7
regulations (3) 14:20;17:5,24
reinforced (1) 10:20
relationship (1) 4:10
release (5) 15:6;16:6;21:16;26:15;33:25
released (1) 34:8
relevant (1) 35:18
remaining (1) 10:15
Remedial (16) 6:21;7:8,16;8:3,3,4;11:11;12:20;15:15,19,24;16:3;22:5,6;36:16,17
remediation (3) 13:7;30:23;35:8
remedies (1) 17:6
remedy (10) 7:1;8:21;19:13,15,24,24;20:9;29:17,19;31:9
remind (3) 3:22;4:1;21:4
removable (2) 25:10;26:20
remove (1) 19:6
rendition (1) 9:19
repairing (1) 28:20
repeat (2) 21:13;33:19
reporter (1) 37:5
repositories (1) 6:7
representatives (2) 20:21;21:2
represented (1) 20:18
required (2) 13:5;16:10
requirement (1) 15:1
resident (1) 14:6
residential (2) 14:1;36:4
residents (1) 15:4
residue (1) 36:3
respond (1) 3:20
responders (3) 24:18;26:3;28:14
responding (2) 19:20;26:4
response (2) 19:19,22
responses (1) 19:22
responsiveness (1) 5:14
rest (1) 26:22
restoration (1) 36:8
results (2) 4:15;11:15
reuse (4) 7:12;15:7,9;29:1
reviews (1) 34:6
RI (3) 6:21;22:23;29:13
RI/FS (2) 7:2,15
Rick (6) 4:21;5:18,24;8:11;15:12,17
right (22) 3:3;7:2,14;8:20,24;19:8,16;20:4,8;22:9,10;24:19,25;25:14;30:21;31:11,14,19,25;32:11;35:5;37:2
Risk (31) 4:12;5:23;12:16,19,24;13:5,6,6,10,16,24;14:13,18,22,25,25;15:8,10,13,23;24:9,21,23,24;25:1,4,5;26:24;28:9;30:20;34:1
risks (8) 7:19;13:8;15:7,10;16:1;24:22;28:9,12
Robinson (47) 4:21,21;8:13;15:20;20:25;21:12,22;22:2,8,11,17;23:22;24:2,15,19;25:3,12,22;26:5,13;27:8;28:6,16,21,24;29:9,17,23;31:1,19,22,25;32:6,8,17;33:9,18,23;34:13,19,25;35:5,10,22;36:2,21,24
ROD (2) 22:3;31:9
roof (2) 25:9;28:2
roofs (1) 28:20
room (8) 11:25;12:1,12,13;18:17;24:6;26:18,18
Rooms (15) 11:18,19;12:10;15:11,12;16:14,21;22:19,22,22;24:3,7;25:12,13,15
routes (1) 13:19

S

safety (1) 24:18
said (4) 15:21;19:19;33:24;35:2
sample (1) 32:14
sampled (2) 30:10;32:10
samples (1) 29:14
sampling (3) 7:17;23:8;35:20
sand (1) 19:6
sander (1) 19:5
say (3) 22:18;31:9;32:13
scabbling (1) 19:4
scanned (1) 23:1
scenario (2) 14:1;24:22
scenarios (3) 15:4;24:20;28:1
screen (1) 19:8
Sean (3) 3:17,24;5:7
second (8) 8:18,22;10:24;11:2,18;16:12;34:19,21
section (1) 25:9
security (3) 27:9,11,14

sediment (1) 9:3
seen (2) 30:14;32:8
select (2) 19:23,24
selected (1) 29:19
selecting (1) 18:24
send (1) 20:6
SEPPI (5) 3:1;4:6,24;20:12;21:4
Services (1) 20:23
session (1) 6:2
sessions (2) 5:6,7
Sevenson (1) 20:22
sewing (2) 12:11,12
shallow (1) 30:20
Sheetrock (1) 25:8
short (5) 3:4;18:2,11;28:8,12
short-term (2) 17:10;18:10
should (2) 7:1;30:14
show (1) 22:19
showed (1) 29:16
showing (1) 10:8
shows (1) 12:8
side (2) 19:8;33:3
signed (4) 9:1;20:2;22:3;29:18
significant (1) 25:10
simpler (1) 23:11
since (1) 17:18
site (33) 3:13;4:5,10,13;5:2,11,20;6:1,7,16,18;7:1,8,11,12,21;8:1,9,14,18;10:2,4,6;12:19,21;13:8,14;14:12;27:9;29:23;30:24;31:2;33:17
sites (4) 6:19;14:18;30:15;35:12
situation (1) 27:16
six (3) 8:5,16;10:21
slide (3) 9:5;22:19,20
slides (1) 6:10
small (5) 10:24;23:6;25:9;26:18,19
soil (9) 8:20;23:13;29:14,18;30:6,23;31:12;35:17,20
soils (5) 29:20;30:2,13;31:10;35:24
solid (1) 25:7
some (12) 5:6;10:8;12:5;22:23;23:19;24:3,7;25:7;28:5;30:10;37:1,3
someone (2) 26:14;27:1
something (3) 24:9;25:24;28:11
sometimes (1) 23:14
somewhere (1) 33:1
sorry (1) 9:2
space (1) 10:23
special (1) 27:11
specific (3) 13:14;33:14,21
sponsored (1) 9:25
spot (1) 23:2
spread (2) 16:20;24:10
square (1) 10:22
stage (3) 7:15;18:17,19
start (5) 6:16;7:9;8:9;20:2,12
started (2) 9:12;27:1
State (7) 9:24;17:5,12,23;20:25;21:2,5
status (1) 34:16
stealing (1) 27:5
stenographer (1) 3:17
step (2) 15:13,21
steps (1) 6:1
sticks (1) 25:7
still (3) 36:4,5,14
stored (1) 25:15
stories (1) 10:22
straightforward (1) 23:17
Street (2) 32:20;33:3
Streets (1) 9:15
structure (3) 23:25;30:1,2
structures (2) 25:7,18
studied (1) 35:17
Study (9) 6:22,24;8:16;11:12;15:18;31:3;34:5;35:13,24
studying (1) 31:14
stuff (5) 23:12,25;26:22;28:3,5
submit (1) 20:6
such (1) 15:14
summary (2) 5:14;19:20
Superfund (9) 5:3,18;6:15,19;12:18;13:4;14:18,19,21
supplemental (3) 33:16;34:12;35:7
supplementary (1) 11:11
sure (4) 4:1;5:20;33:8,9
surface (6) 8:25;9:3;12:4,4;23:24;30:3
surfaces (6) 11:17;16:5;19:3,7,10;26:18
survey (1) 34:16
Swim (2) 10:10;36:6
SZEGEDI (1) 22:10

T

take (6) 3:13;7:24;16:24;22:1;28:7;32:14
taken (2) 31:18;32:23
takes (1) 8:4
taking (1) 33:25
talk (13) 4:3,15;5:17,19,21,23;6:1;7:12;12:16;15:18;28:1,16;37:1
talked (2) 10:14;31:23
talking (1) 6:13
tall (1) 10:22
team (1) 20:23
technology (1) 18:5
Temple (1) 10:10
term (4) 18:11,11;28:8,12
Terminals (1) 10:18
testing (1) 19:12
Thank (5) 12:17;36:23,25;37:5,6
Thanks (2) 8:13;15:20
them (6) 4:9,20;16:25;17:3;20:6;29:5
themselves (1) 4:9
they (29) 9:14,15,17,20,21;10:6;11:8;13:18,20,21;16:15;17:2,8;19:9,9;20:18;21:18;24:22;25:14,15;27:5;28:25;29:1,3,6;32:23,25;33:1,2
thing (1) 30:18
things (8) 3:1;12:2;24:16;25:13;29:15;32:4;36:22;37:3
think (6) 8:6,10;9:5;21:25;27:15;33:4
third (5) 8:25;11:2,3,19;12:13
this (60) 3:4;5:2,11;6:7,15;7:24;8:10,17;10:7,9,13;12:8,12,22;13:8,10,12,14,22,24;15:3,12;17:14;19:17;20:10,16,24;21:8;22:15,16,17,21,22,23,25;23:4,7,11;25:19;26:2,4,15;27:9,16;28:5;29:22,24,24;30:2,24;32:3,18,19,20;33:1,2,3,13;35:12,20
thorium (4) 9:9,9;10:5;11:21
Thorium-232 (1) 11:25
those (14) 3:13;7:16;12:10;14:15;15:7,14;16:21,21;18:13;22:15;24:10;25:15;26:7;36:18
though (1) 36:20
thought (1) 32:1
three (8) 6:7,7;10:21;16:8,9;17:16;28:19,21
threshold (2) 17:1;18:8
through (8) 10:13;13:20;19:2,17;20:7;24:10;26:25;32:3
throughout (3)

11:24;16:22;35:24
time (6) 11:23;28:17;33:4,5;36:19,21
times (4) 3:7;5:2;8:4;14:5
tip (1) 23:14
today (3) 12:11,14;17:14
to-do (1) 31:17
together (1) 20:23
tonight (14) 3:17,18;4:3,8;5:8,15;6:13;7:24;15:15;18:25;19:22;20:19,21;21:3
took (1) 12:5
top (1) 12:3
touch (1) 26:21
toxicity (6) 13:2;14:15,17;17:9;18:2,6
training (1) 10:25
transcript (1) 19:22
transects (1) 22:24
trespasser (1) 27:5
trespassers (1) 27:15
true (1) 20:17
try (1) 7:18
turn (3) 8:10;12:15;15:17
two (8) 8:17;12:24;15:11;16:12;17:1;23:21;33:12;36:12
type (2) 18:19;22:15

U

Um-hum (1) 34:25
unacceptable (1) 15:23
uncontrolled (1) 15:6
Under (7) 13:4,9;14:1,19,20;15:5,9
underneath (2) 25:20,24
understand (1) 22:12
unit (5) 8:18,19,22,25;9:5
Unless (1) 27:1
until (3) 3:6;30:16;33:3
up (22) 3:10;6:23;7:8,22;9:11,14,20;10:2,11;20:8;21:16,18;23:7,10,14,15;25:9;29:16;30:13,14;36:2,13
upgrading (1) 27:13
upper (1) 19:7
use (6) 14:17;21:10,14;33:15,21;35:12
used (5) 9:10;10:24;21:17;25:14;30:19
using (1) 9:9
usually (1) 3:2

V

vacant (1) 25:16
values (1) 14:17
variety (1) 15:3
various (1) 14:8
vary (1) 14:11
versus (3) 16:11;17:17;18:22
Vince (1) 29:12
volume (3) 17:10;18:3,6
Voluntary (1) 11:6
von (1) 9:7

W

wait (1) 32:20
Walker (4) 28:18,18,23;29:7
walking (1) 26:25
wall (1) 27:6
walls (5) 11:3;23:1,20;24:7;28:20
Walt (1) 32:23
want (6) 6:12;7:24;28:25;29:6;33:19;37:3
wanted (4) 3:2;20:19;29:1,3
wants (1) 34:9
Warehousing (1) 11:5
wasn't (1) 25:1
waste (1) 19:14
watch (1) 10:3
water (5) 8:25;9:3;30:3,3,19
way (1) 26:15
we (183) 3:1,2,4,13,16,20;4:2,8,13,25;5:3,10,16,24;6:3,7,8,9,10,13,16,17,20,23,25;7:5,7,8,9,10,10,12,14,17,17,18,19,19,23,24,25;8:8,19,20;9:1;10:9;11:11,16,23,24,25;12:2,5,19,23,25;13:4,7,9,11,14,17,19,22,25;14:1,7,9,14,16,17,18,21,24,25;15:3,5,9,15,22,22,23;16:8,8,10,20,24,24;17:6,13,16;18:24;19:4,8,11,16;20:2,10,15,17,23;21:15,16;22:3,4,8,22,23,24,24;23:1,2,5,7,7,9,10,10,13,14,19,20;24:15,19,20,21;25:4;27:7;28:6,8,16;29:9,10;30:5,7,10,13,15;31:3,5,8,9,9,11,13,13,14,14,23;32:6,8,10,13,16,17,17,21,22;33:4,5,23,24,25;34:2,8,14,14,15,16;35:11,14,22;36:2,4,7,8,10,12,13,14,25;37:1,2
website (2) 6:9,14
we'd (2) 3:5;20:8
week (1) 14:5
weeks (1) 14:5
well (8) 10:4;15:4;22:2;24:19;29:15,17;31:1;32:14
we'll (18) 3:9;4:15;5:8,21,24;6:2;8:3;18:11;19:13,18,19,20,23,24;20:6;30:8;34:15;36:16
Welsbach (12) 3:13;4:4;9:8,11,19;10:5,6,9;12:9;32:19;33:2;35:13
Welsbach/General (1) 8:14
Welsbach's (1) 10:16
we're (3) 3:14;6:16;33:9
wetlands (1) 9:4
we've (6) 7:21;8:16;17:20;23:18;29:18;30:14
what's (6) 5:13;6:20;7:13;21:10;24:25;26:11
when (14) 3:23;6:17;9:11;22:13,23;23:13;24:15,21;26:10,14;30:10;32:23;33:12,18
where (24) 5:3;6:8;7:2,9,14,23,24;10:3;15:14;19:9;20:13;22:22,23;23:16;25:9;26:6,19,19;27:8;30:12;31:3,5,11;35:23
Whereas (1) 18:1
whether (1) 13:2
which (18) 4:4;5:11,14,20;6:17;7:3,6;8:23,24;11:21,23;14:20;15:18;16:9;17:1;28:5;30:6;34:16
white (1) 22:24
Whitman (1) 32:24
whole (2) 5:2;29:14
why (4) 5:7;16:22;28:6;30:15
wide (1) 27:25
wider (3) 22:14,15,15
William (1) 21:24
windows (2) 24:8;28:2
within (9) 12:3;14:16;15:8;23:21;24:22;25:4;26:17,22;30:1
without (1) 29:4
women (1) 12:11
wood (2) 25:17,18
word (1) 24:25
work (6) 8:9;11:8;20:16,17,23,24
workday (1) 14:4
worker (1) 14:3
workers (3) 14:2,3;15:5
works (2) 3:3;14:21
worry (2) 3:25;29:4
worse (1) 28:11
worst (1) 13:13
would (28) 6:3,3;8:6,6,7,8;12:25;14:6;18:5,16,18;19:21;20:15;21:18,20,22;24:24,24;25:3;26:8,8,

24;27:20;28:5,13;29:2;
32:13;35:19
writing (1)
19:21
written (2)
20:5,7

X

X-ray (2)
27:21,24

Y

year (10)
8:5,7;11:21,24;14:4,5,
7;22:9,9,11
years (3)
6:17;28:10;30:7
Yes (7)
21:22;25:3,23;30:25;
31:22;33:20;35:10
young (1)
13:25

ATTACHMENT D

WRITTEN COMMENTS RECEIVED BY EPA

From: "Linda Lord" <ladnila@comcast.net>
To: Rick Robinson/R2/USEPA/US@EPA
Date: 08/07/2011 10:37 AM
Subject: Gloucester City Clean-up Effort

Dear Mr. Robinson,

I am a Gloucester City resident and I hope the effort to clean up our area is successful. I hope that environmental concerns continue to be realized in the future. I hope that the ban on hydro-fracking also continues until the procedure, itself, is made safer. My children and grandchildren are counting on you. Thanks for letting me have my say.

Linda Lord
325 Bergen Street
Gloucester City, NJ 08030
(member- DVRPC-RCC)

MANKO | GOLD | KATCHER | FOX LLP

AN ENVIRONMENTAL AND ENERGY LAW PRACTICE

Jill Hyman Kaplan
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PHILADELPHIA, PA
*CHERRY HILL, NJ
by appointment only

* Partner responsible - Bruce S. Katcher

August 22, 2011

Via Electronic Mail
Richard Robinson, Remedial Project Manager
USEPA
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: Comments on Proposed Remedial Action Plan for Armstrong Building

Dear Rick:

On behalf of our client, GMT Realty, LLC ("GMT"), the current owner[1] of the Armstrong Building (the "Building") at the Welsbach/ General Gas Mantle Contamination Superfund Site (the "Site"), we are submitting the following comments on the July 2011 Proposed Remedial Action Plan ("PRAP") for the Building.

I. Adequacy of Preliminary Remediation Goal

The Preliminary Remediation Goal ("PRG") established in the PRAP appears to be appropriate. According to GMT's radiological expert, a PRG of 500 disintegrations per minute per 100 square centimeters should be protective of the public and the environment. The PRAP does, however, appear to contain a typographical error in that it states that this PRG is for OU3 instead of OU2 (which is the Building). EPA should also confirm that NJDEP will accept this PRG as satisfying their dose-based radiological release criteria of 15 millirem per year total effective dose equivalent. Finally, EPA should clarify its statement on page 9 of the PRAP that the PRG has been selected "for both fixed and removable contamination." It is unclear how EPA evaluated the percentage of risk from contamination that is fixed versus removable, and NJDEP should confirm that EPA's evaluation of risk from fixed and removable contamination is acceptable for purposes of satisfying its dose-based release criteria.

[1] Pursuant to 42 U.S.C. §§ 9601(4) and 9607(r), GMT is a bona-fide prospective purchaser ("BFPP") and so has no liability at the Site.

II. Adequacy of Risk Assessment

In performing the baseline risk assessment ("BRA") for the Building, EPA correctly noted that the upper bound of the acceptable cancer risk for radionuclides is 1 in 10,000 per the National Contingency Plan ("NCP"). However, EPA appears to have misapplied the acceptable risk standard for various hazards evaluated in the BRA, stating that 2 and 3 in 10,000 was "near the upper bound of the risk range" when it is actually a risk that is 2 or 3 times greater than the acceptable upper bound, respectively.

III. Decontamination Must Not Leave GMT, a BFPP, With Increased Costs Due to Radiologic Contamination

In addition to ensuring that the remediation of the Building results in a structure that does not present a risk to human health or the environment in its existing state, EPA must also ensure that future demolition and related disposal activities can occur without any restrictions relating to residual radiologic constituents remaining in or under the Building at the end of the remediation. Specifically, at the completion of EPA's remediation, the Building must be left ready for demolition using normal means and methods without any additional health and safety requirements, and all of the resulting debris must be eligible for the ordinary means of managing demolition waste (e.g., through reuse as fill on or off site or by disposal in a RCRA Subtitle D landfill or specially permitted construction and demolition landfill). Any impact on the ability to perform such unrestricted demolition and debris management would mean that GMT, a BFPP, has been improperly saddled with at least part of the cost of the radiologic contamination at the Building.

In order to ensure that costs associated with the radiologic contamination are not improperly left for GMT, EPA must confirm that there will be no federal licensing requirements or analogous State licensing requirements for the Building, or any demolition debris generated therefrom, relating to radiologicals following the decontamination proposed in the PRAP. In addition to the U.S. Nuclear Regulatory Commission, the New Jersey Department of Environmental Protection has authority to license radioactive material, including byproduct as well as technologically enhanced naturally occurring radioactive material ("TENORM").[2] NJDEP has exercised this authority in the past to license materials contaminated with radiologic constituents from past industrial practices. It is unclear from the PRAP whether a radiological license has or will be issued relating to the contamination in the Building or at the Site.

The presence of a license can present significant obstacles to the traditional means of managing demolition debris. For example, 25 Pa. Code §§ 273.201(l) and 277.201(m) prohibit

[2] By virtue of becoming an "Agreement State" in 2009, New Jersey assumed primary responsibility for licensing certain radioactive materials, including byproduct and TENORM, from the U.S. Nuclear Regulatory Commission. New Jersey's licensing requirements are set forth in N.J.A.C. § 7:28.

the disposal of certain "radioactive material controlled under specific or general license or order authorized by any Federal, State or other governmental agency" in a Pennsylvania Subtitle D landfill or construction and demolition waste landfill, respectively. If a license relating to the radioactive materials has or will be issued, EPA should be responsible for terminating that license as part of the remedial action undertaken at the building.[3] EPA should also confirm that a Subtitle D landfill or construction and demolition waste landfill within a reasonable distance of the Site will accept the future demolition debris, despite the past presence of radiological contamination, and in light of the remediation in the Building as proposed.

GMT also notes that the PRAP indicates that final status surveys ("FSSs") will only be conducted in the remediated rooms and not for the entire Building. EPA should retain responsibility for conducting additional investigative and remedial activities (including FSSs) if additional areas of radiological contamination are identified in or under the Building in the future.

IV. Decontamination May Not Address Unidentified Contamination

The PRAP states that EPA will investigate and remediate areas previously deemed inaccessible as part of the remedial design for decontamination, but it is unclear in the PRAP how EPA will gain access to certain of these areas. For example, the areas with poured concrete floors, exterior walls underneath drains and a below-grade pipe chase, all of which are listed as inaccessible in the PRAP. In addition, it remains unclear how EPA will investigate and remediate several areas that were previously deemed structurally unsafe, including the elevator shaft, stairways and connectors. Is EPA proposing to temporarily shore these areas? As discussed below, EPA should consider demolition to access and permanently address these areas instead. Moreover, without complete or partial demolition of the Building, certain areas (including underneath the Building and in Room 11 where contamination in the floor was detected deeper beneath the surface) will remain inaccessible. Thus, the decision to only decontaminate the portions of the Building with identified contamination could result in leaving unidentified contamination in or under the Building. Any unidentified contamination left in place could be released in future construction activities or through a future collapse of the Building. At a minimum, and as discussed below, EPA should consider the partial demolition of certain portions of the Building.

In contrast to the proposed decontamination, demolition of relevant portions of the Building would allow access to currently inaccessible materials in and under the Building and would minimize or eliminate the potential for leaving unidentified and unaddressed contamination. Further, in evaluating and comparing the remedial alternatives against the criteria in 40 CFR 300.430(e)(9)(iii) of the NCP, the PRAP states that decontamination and

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[3] Licensing requirements may implicate the potentially onerous 10 CFR § 20.2002 process, which New Jersey has incorporated pursuant to N.J.A.C. § 7:28-6.1(a), to authorize alternate disposal such as at a Subtitle D landfill.

demolition would provide a similar level of protection to human health and the environment and that both alternatives offer long-term effectiveness. However, given the potential for future releases of residual unidentified contamination associated with the decontamination alternative, either complete or partial demolition would be more protective and would offer more long-term effectiveness. Moreover, EPA does not appear to have assessed the risks to workers implementing the different remedial alternatives. The risk to remediation workers could be substantially lower for demolition than decontamination given the comparatively limited exposure the demolition workers would have to the radioactivity, structural and other environmental hazards in the Building. Finally, the PRAP also indicates that decontamination is readily implementable while demolition would pose significant access and staging issues. GMT is confident that any access and staging issues can be resolved and would not present an impediment to implementing an alternative involving complete or partial demolition of the Building.

V. An Insufficient Number of Alternatives Were Evaluated

EPA did not evaluate the true range of potential alternatives to allow a remedy to be properly selected in accordance with the NCP. In preparing the PRAP, EPA only performed a detailed screening of three alternatives: no action, decontamination of the Building, and demolition of the entire Building. In contrast, the Feasibility Study prepared in 2000 for GMT evaluated 6 additional alternatives (surface sealing, two options involving limited decontamination and then complete demolition, and three options involving partial demolition and limited decontamination).[4] Because, as the PRAP acknowledges, the radiological contamination appears to be primarily confined to certain areas of the Building, alternatives involving demolition of these areas should have been evaluated by EPA as discussed below.

EPA should also confirm that its cost estimate for demolition is correct. The 2000 Feasibility Study prepared by GMT calculated a total cost for demolition of approximately $5.3M assuming that all of the waste generated (calculated to be 17,600 CY) could be sent to a landfill. Even assuming that all of the waste generated by demolishing the building would need to go to Envirocare in Utah, the total cost of demolition was estimated to be approximately $52M. The PRAP assumes that only 3,900 CY of the 19,500 CY that would be generated by demolition will need to go to Envirocare with the remainder going to a Subtitle D landfill in Pennsylvania. Yet, the PRAP estimates the total cost of demolition as $103M.

[4] While the Feasibility Study prepared on its behalf in 2000 listed decontamination of the building as the preferred alternative, that preference was at least in part based upon a desire to continue using the building following decontamination. In the more than ten years that has transpired since that Feasibility Study was issued, the condition of the Building has deteriorated to the point that the majority of it no longer can be reused once decontaminated. Accordingly, the delay in addressing the radioactive contamination in the Building has significantly impacted GMT's future options for the Building.

VI. Partial Demolition Should be Evaluated

EPA should evaluate at least two options involving partial demolition of the Building which is actually comprised of five (5) adjacent sub-buildings as shown on the attached diagram. Specifically, EPA should evaluate demolishing most of the areas of the Building with levels of radioactive contamination and should also evaluate performing this partial demolition after decontaminating the areas to be demolished. The areas of the building with acceptable levels of radioactivity could then be left for unrestricted future demolition, renovation or future re-use.[5]

GMT proposes that EPA evaluate an option in which sub-buildings 3 and 5 and the southern half of sub-building 1 (i.e., Rooms 1, 8 and 15) are retained, with only Room 15 then requiring decontamination. In this alternative, sub-buildings 2 and 4 and the northern half of sub-building 1 would be demolished, either with or without first being decontaminated. Such partial demolition and/or decontamination would thereby also address the contamination present and proposed for remediation in Rooms 9, 10, 11, 13, 17, 21 and Area A. This partial demolition would also permanently address almost all of the areas previously identified as inaccessible. Specifically, out of the 9 areas listed as inaccessible on page 5 of the PRAP, the proposed partial demolition would address most of the roof and the structurally unsafe elevator shaft, stairways and connector. Partial demolition would also afford EPA access to almost all of the exterior walls, areas with poured concrete and possibly the below-grade pipe chase. Finally, many of the painted and tiled areas, and the inaccessible wall areas in Rooms 11, 12, 14 and 20 would be addressed by the proposed partial demolition.

As noted above, demolition is more permanently protective than decontamination because it will address both identified and unidentified contamination in the portions of the Building that are demolished. In addition, by demolishing the areas of the structure with radioactive contamination that requires remediation, it is less likely that GMT (a BFPP) will be improperly left with future costs associated with the radiologic constituents present in these portions of the Building. EPA demolishing and managing the debris from the most contaminated portions of the Building would also afford GMT the option to renovate and reuse the less contaminated portions of the Building. If GMT decides to subsequently demolish these remaining areas, it would also more equitably leave GMT to only manage demolition debris from the less contaminated portions of the Building.

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[5] As noted above, the Feasibility Study prepared in 2000 for GMT evaluated partial demolition and limited decontamination. Specifically, this option involved demolishing sub-buildings 2, 3, 4 and 5, and the northern part of sub-building 1. For purposes of the current PRAP, GMT is proposing that EPA evaluate a more cost effective partial demolition option that does not demolish sub-buildings 3 and 5. These sub-buildings do not contain radioactive contamination that require remediation according to the PRAP.

Conclusion

In summary, GMT respectfully requests that EPA remediate the radioactive contamination in the Building in a manner that ensures that future demolition and debris management activities can occur without any restrictions relating to that contamination. GMT also requests that EPA evaluate the additional alternatives identified above relating to partial demolition (with or without prior decontamination) to address many of the issues and concerns identified in this letter. GMT appreciates the opportunity to submit these comments on the PRAP.

Sincerely,

Jill Hyman Kaplan

Jill Hyman Kaplan
For MANKO, GOLD, KATCHER & FOX, LLP

11829-1001

cc: Lisa Kline, Esq.
Matthew C. Sullivan, Esq.

August 30, 2011

Rick Robinson
Remedial Project Manager
US EPA
290 Broadway 19th Floor
New York, NY 10007-1866

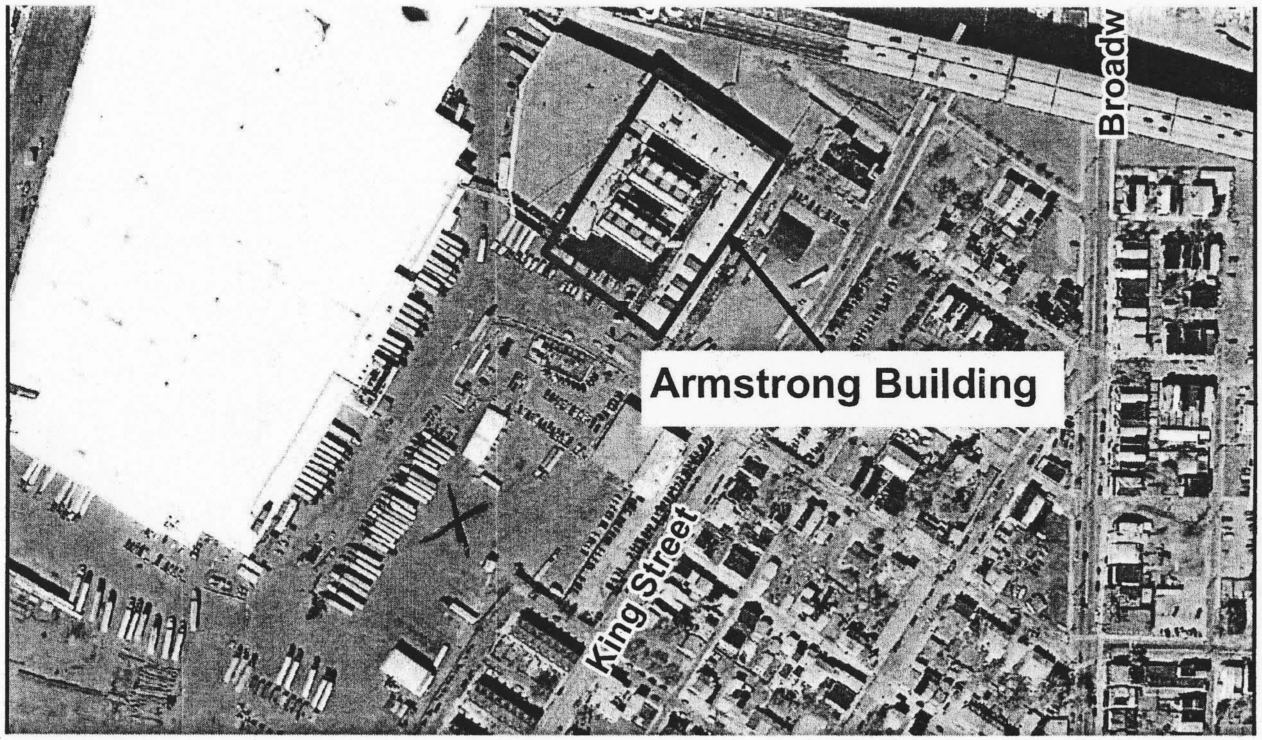
Dear Mr. Robinson,

I realize it's past the comment period for the Welsbach/General Gas Mantle Contamination Superfund Site at Holt Terminal in Gloucester City, NJ; I only saw the report yesterday. And you may have received this information already. I work for another federal agency that is on this site daily. When I pass over a section of the parking lot adjacent to the old Armstrong Building I get a reading on my radiation pager. X marks the approximate spot on the attached photo. This area is used by Fresh Del Monte and other importers to stage their loads of fruit prior to delivery to grocery chains throughout the northeastern US. The waste ore described in the superfund report had to go somewhere and it seems likely the most expedient use was as fill dirt for the later construction of the Holt terminals and parking areas.

My immediate management has never really incorporated the post 911 mandate regarding interagency cooperation. For this reason I cannot sign this letter. But I urge you in the strongest terms to walk this area and get you own readings and determine if this constitutes a food safety threat.

Yours truly,

A concerned federal employee


Broadw
Armstrong Building
King Street

APPENDIX IV

ADMINISTRATIVE RECORD INDEX

WELSBACH AND GENERAL GAS MANTLE (CAMDEN RADIATION)
OPERABLE UNIT TWO
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain Of Custody Forms

P. 300001 - 300460 — Report: Data Validation Report for Radioactive Analysis, Welsbach/General Gas Mantle Superfund Site, Sample Matrix: Brick and Concrete, Analysis Type: Thorium (iso), Ra-226, Ra-228, K40, Laboratory: Outreach, Project Number: 20100812, prepared by Malcolm Pirnie, Inc., undated.

DocID 111181

P. 300461 - 301057 — Report: Data Validation Report for Radioactive Analysis, Welsbach/General Gas Mantle Superfund Site, Sample Matrix: Brick, Tile and Concrete, Analysis Type: Thorium (iso), Ra-226, Ra-228, K40, Laboratory: Outreach, Project Number: 20100813, prepared by Malcolm Pirnie, Inc., undated.

DocID 111182

P. 301058 - 301409 — Report: Data Validation Report for Radioactive Analysis, Welsbach/General Gas Mantle Superfund Site, Sample Matrix: Brick and Concrete, Analysis Type: Thorium (iso), Ra-226, Ra-228, K40, Laboratory: Outreach, Project Number: 20100814, prepared by Malcolm Pirnie, Inc., undated.

DocID 111183

3.3 Work Plans

P. 301410 - 301475 — Report: Draft RI/FS Work Plan for the Armstrong Building, Report No. 97013/G-4160, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing System, Inc., December 16, 1997.

DocID 111184

P. 301476 - 301531 — Report: Draft Field Operations Plan for the Armstrong Building, Report No. 97013/G-4161, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing System, Inc., December 16, 1997.

DocID 111185

P. 301532 - 301618 Report: Data Gap Plan, OU2 - Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Gloucester City, New Jersey, prepared by Malcolm Pirnie, Inc., June 29, 2010.

DocID 111186

3.4 Remedial Investigation Reports

P. 301619 - 301853 Report: Final Remedial Investigation Report for the Armstrong Building, Report No. 97013/G-6166, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing System, Inc., July 14, 1998.

DocID 111187

P. 301854 - 301887 Report: Draft Baseline Risk Assessment for the Armstrong Building, Report No. 97013/G-12192, R2, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing Systems, Inc., January 6, 2000.

DocID 111188

P. 301888 - 302113 Report: Baseline Risk Assessment for the Armstron Building, Appendix: RESRAD-BUILD Outputs, Report No. 97013/G-12192, R2, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing Systems, Inc., January 7, 2000.

DocID 111189

P. 302114 - 302166 Report: Welsbach/General Gas Mantle (GGM) Superfund Site, Asbestos and Lead Screening Report, Armstrong Building, Gloucester City, New Jersey, prepared by Malcolm Pirnie, Inc., prepared for U.S. Environmental Protection Agency, Region 2 and U.S. Army Corps of Engineers, Kansas City District, December 2009.

DocID 111190

P. 302167 - 302189 Report: Technical Memorandum, A Comparison of RESRAD-Build with the Online EPA BPRG Calculator Tool for the Armstrong Building at the Welsbach/GGM Superfund Site, prepared by U.S. Army Corps of Engineers, Kansas City District, June 9, 2011.

DocID 111191

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400051 Report: Draft Comparative Analysis of Remedial Alternatives for the Armstrong Building, Report No.

DocID 111192

97013/G-7168, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing System, Inc., May 26, 1999.

P. 400052 - 400117 Report: Draft Feasibility Study for the Armstrong Building, Report No. 97013/G-7193, prepared by Integrated Environmental Management, Inc., submitted to Holt Hauling and Warehousing System, Inc., January 6, 2000.

DocID 111193

WELSBACH AND GENERAL GAS MANTLE (CAMDEN RADIATION)
OPERABLE UNIT TWO
ADMINISTRATIVE RECORD FILE UPDATE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.1 Background - RCRA and other Information

P. 100001 - 100010 Photographs: Radiological Scans, Background Survey, undated.
Doc. ID# 111398

P. 100011 - 100025 Photographs: Radiological Scans, Room 8, undated.
Doc. ID# 111399

P. 100026 - 100058 Photographs: Radiological Scans, Room 9, undated.
Doc. ID# 111400

P. 100059 - 100066 Photographs: Radiological Scans, Room 11, undated.
Doc. ID# 111401

P. 100067 - 100075 Photographs: Radiological Scans, Room 12, undated.
Doc. ID# 111402

P. 100076 - 100089 Photographs: Volumetric Samples, undated.
Doc. ID# 111403

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 302190 - 302200 Report: Radon Monitoring Report, Acct. No. 0408284, prepared by Landauer, Inc., prepared for Malcolm Pirnie, Inc., November 22, 2010.
Doc. ID# 111404

3.4 Remedial Investigation Reports

P. 302201 - 302315 Report: Final Supplementary Remedial Investigation Report, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden
Doc. ID# 111405

and Gloucester City, New Jersey, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July 2011.

P. 302316 - 302551 Report: Final Supplementary Remedial Investigation Report, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, Appendix A, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July, 2011.

Doc. ID# 111406

P. 302552 - 302754 Report: Final Supplementary Remedial Investigation Report, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, Appendices B-I, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July, 2011.

Doc. ID# 111407

P. 302755 - 303362 Report: Final Supplementary Remedial Investigation Report, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, Appendix J, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July, 2011.

Doc. ID# 111408

P. 303363 - 305425 Report: Final Supplementary Remedial Investigation Report, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, Appendix K, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July, 2011.

Doc. ID# 111409

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400118 - 400206 Report: Final Feasibility Study, OU2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, prepared by ARCADIS/Malcolm Pirnie, prepared for U.S. Army Corps of Engineers, Kansas City District, July 2011.

Doc. ID# 111410

10.0 PUBLIC PARTICIPATION

10.3 Public Notices

P. 10.00001 - 10.00001 — Public Availability Session Announcement for Mailing: EPA is Hosting a Public Meeting for the Armstrong Building, Welsbach/General Gas Mantle Superfund Site, August 3, 2011.

Doc. ID# 111411

P. 10.00002 - 10.00002 — Public Availability Cable Notice: Welsbach/GGM Superfund Site, Public Meeting to Discuss EPA's Proposed Remedial Action for the Armstrong Building on the Gloucester Marine Terminal in Gloucester City, August 3, 2011.

Doc. ID# 111412

10.4 Public Meeting Transcripts

P. 10.00003 - 10.00029 — Armstrong Building Presentation: Public Meeting Proposed Plan, Operable Unit (OU)2: Armstrong Building, Welsbach/General Gas Mantle Contamination Superfund Site, Camden and Gloucester City, New Jersey, August 3, 2011.

Doc. ID# 111413

10.9 Proposed Plan

P. 10.00030 - 10.00045 — Report: Superfund Program Proposed Plan, Welsbach/General Gas Mantle Contamination Superfund Site, prepared by U.S. Environmental Protection Agency, Region 2, July 20, 2011.

Doc. ID# 111414

APPENDIX V

STATE LETTER OF CONCURRENCE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION PROGRAM
Mail Code 401-06
P. O. Box 420
Trenton, New Jersey 08625-420
Tel. #: 609-292-1250
Fax. #: 609-777-1914

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

SEP 20 2011

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Welsbach/General Gas Mantle Contamination Superfund Site
Record of Decision

Dear Mr. Mugdan:

The New Jersey Department of Environmental Protection (DEP) completed its review of the "Record of Decision, Welsbach/General Gas Mantle Contamination Superfund Site, Operable Unit 2: Armstrong Building, Gloucester City and Camden, Camden County, New Jersey, Site ID: NJD986620995," prepared by the U.S. Environmental Protection Agency (EPA) Region II in September 2011. DEP concurs with the selected remedy to address radiological contamination at the Armstrong Building at the Welsbach portion of the site.

The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Administrative Record file for this site. The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

The selected remedy for the Armstrong Building is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action and is cost effective.

The response action described in the ROD addresses radiologically contaminated building surfaces in the Armstrong Building at the Welsbach Site. It represents the second of four planned remedial phases, or operable units, for the Welsbach site. EPA issued a ROD for the first Operable Unit on July 23, 1999 to address soil contamination. On September 25, 2005, EPA signed a ROD for the third Operable Unit that indicated that no remedial action was necessary for the surface water, sediments and wetlands at the Welsbach Site. A fourth Operable Unit is planned to address potential groundwater contamination.

The major components of the Selected Remedy are:

- Decontamination (physical and/or chemical) of radiologically-contaminated building surfaces in the Armstrong Building.

- Transportation of radiologically-contaminated wastes generated during the remedial action to an approved off-site facility.

No treatment technologies are available that will reduce the toxicity, mobility or volume of radium and thorium. Decontamination will reduce the mobility of radioactive contaminants by removal, off-site disposal, and management of these wastes at an approved landfill permitted to accept radioactive waste

DEP appreciates the opportunity to participate in the decision making process to select an appropriate remedy and is looking forward to future cooperation with EPA in further remedial work at this site.

If you have any questions, please call me at 609-292-1250.

Sincerely,

Dave Sweeney, Assistant Commissioner
Site Remediation Program

C: Ed Putnam, Assistant Director, Site Remediation Program, DEP
Carole Petersen, Chief, New Jersey Remediation Branch, EPA Region II